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OR

MISCELLANEOUS TRACTS

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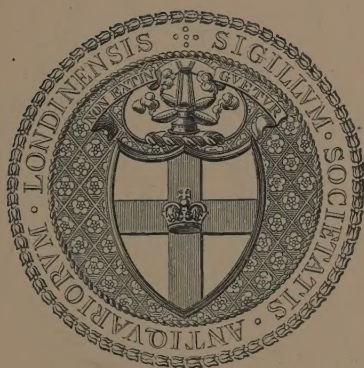
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SECOND SERIES: VOLUME XXVII

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LIST OF ILLUSTRATIONS

THE DECORATION OF THE BEAUCHAMP CHAPEL, WARWICK, WITH SPECIAL REFERENCE TO THE SCULPTURES :

I.—*Classification and Nomenclature of Beads and Pendants.* By Horace C. Beck, *Esq., F.S.A.*

Read 19th October 1926

INTRODUCTION

THIS paper is written in the hope that it may assist in getting more uniformity in the description of beads. At the present time there is no general agreement between different archaeologists as to how a bead should be described. For my own work I have found it essential to have some classification and nomenclature, and I have endeavoured in this paper to work out a system applicable to the beads of all countries. I will give two instances showing the necessity for some definitions. The first is that I consulted two well-known archaeologists, working on the beads of different countries, as to what they considered a disc bead. They did not agree, in fact the only point on which they did agree was that no bead called a disc bead by the other should be called a disc bead. The second instance is taken from the *Antiquaries Journal* for July 1925, where it is stated that a coloured Anglo-Saxon bead of the *usual* type was found.

The question whether pendants should be included has been a difficult one to decide. I have consulted a number of archaeologists, who all agreed that in many cases it was almost impossible to say whether certain objects were beads or pendants. I have therefore decided to include them. I considered the advisability of making a separate division for them, but when I found that a difference in the perforation was sufficient to change an object from a bead into a pendant, I decided to include them as subgroups in Division III. Again, on account of the difficulty of drawing a satisfactory line between inscribed beads and perforated seals, the latter, together with scarabs and cylinders, have been included; but only so far as to allot them groups (nos. XXXVI–XLI) without attempting in any way to classify them further.

Whilst it is hoped that most of the varieties of beads have been allotted places in this classification, it has not been possible to deal with the subject of pendants so fully.

Before going into the question of the classification itself I have found it necessary to give a number of definitions, defining the meaning of various terms as applied to beads.

To describe a bead fully it is necessary to state its form, perforation, colour, material, and decoration.

It has not been found practicable to make a classification on an entirely consistent system. Form has been the chief consideration, but there are a number of beads of forms included in the first two divisions whose importance is due much more to their decoration than to their shape. Many of these have been included in various groups in Division III. In fact, groups XLVI and XLVII consist almost entirely of such beads.

This paper is divided as follows :

Part I.   Definitions.   Part IV. Colour.
Part II.   Classification.   Part V.   Material.
Part III. Perforation.   Part VI. Decoration.

In presenting this paper I wish to acknowledge the assistance I have received from various sources. My thanks are especially due to Professor Myres, Professor Sir W. Flinders Petrie, Dr. H. R. Hall, Mr. Reginald Smith, Mr. Guy Brunton, and Mr. Louis Clarke for helpful suggestions, and to Mr. A. P. Trotter for his assistance in drawing a large number of the illustrations.

PART I.   DEFINITIONS

Axis. The axis of a bead is an imaginary line through the centre of the perforation. Fig. 1.

Transverse section. The transverse section is that section at right angles to the axis which has the largest area. Fig. 2.

Perimeter. The perimeter is the line or lines bordering the transverse section. Fig. 2.

Diameter. The diameter is the maximum width of the transverse section. Fig. 2.

Major radius. When the transverse section is not symmetrical round the axis, the maximum distance from the axis to the perimeter is called the major radius. Fig. 2.

Longitudinal section. The longitudinal section is that section along the axis that includes the major radius—that is, the section that shows the greatest distance from the axis to the profile. In faceted beads it generally goes through the axis and an edge. Fig. 3.

End. If the surface at the end of the perforation is approximately flat, or is concave, it is called an end. If, however, it is so convex or conical as to form a feature of the bead it is considered as part of the profile of the bead. Fig. 3.

Apex. When the bead has no 'end' the point where the profile meets the perforation is called the apex of the bead. Fig. 3.

Profile. The line or lines bordering the longitudinal section, joining the two ends, or apexes of the bead, are called the profile. In many cases the two

SUBDIVISION I. ROUNDED BEADS.
Groups V, VI and VII have one flat surface.

SUBDIVISION II. FACETED BEADS.

	Longitudinal Section.				Longitudinal Section.		
Transverse Section.				Transverse Section.			
Group I Circular.		I.C.1.a.	I.C.2.b.	I.C.2.e.	**Group VIII** Triangular.	VIII.C.1.a.	VIII.C.2.b.	VIII.C.2.e.

Group I Circular. — I.C.1.a. I.C.2.b. I.C.2.e.
Group II Elliptical. — II.C.1.a. II.C.2.b. II.C.2.e.
Group III Ovoid. — III.C.1.a. III.C.2.b. III.C.2.e.
Group IV Lenticular. — IV.C.1.a. IV.C.2.b. IV.C.2.e.
Group V Plano-convex. — V.C.1.a. V.C.2.b. V.C.2.e.
Group VI Semicircular. — VI.C.1.a. VI.C.2.b. VI.C.2.e.
Group VII Circle and Flat. — VII.C.1.a. VII.C.2.b. VII.C.2.e.

Group VIII Triangular. — VIII.C.1.a. VIII.C.2.b. VIII.C.2.e.
Group IX Square. — IX.C.1.a. IX.C.2.b. IX.C.2.e.
Group X Rectangular. — X.C.1.a. X.C.2.b. X.C.2.e.
Group XI Diamond. — XI.C.1.a. XI.C.2.b. XI.C.2.e.
Group XII Pentagonal. — XII.C.1.a. XII.C.2.b. XII.C.2.e.
Group XIII Hexagonal. — XIII.C.1.a. XIII.C.2.b. XIII.C.2.e.
Group XIV Octagonal. — XIV.C.1.a. XIV.C.2.b. XIV.C.2.e.
Group XV Polygonal. — XV.C.1.a. XV.C.2.b. XV.C.2.e.
Group XVI Tabular. — XVI.C.1.a XVI.C.2.b. XVI.C.2.e.

profiles of a bead are different; in such cases, if only one profile is mentioned, it generally refers to the one which is at the end of the major axis—that is, the profile which is farthest from the axis at one point.   Fig. 3.
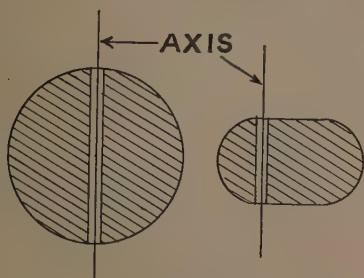
Fig. 1.   Axis.
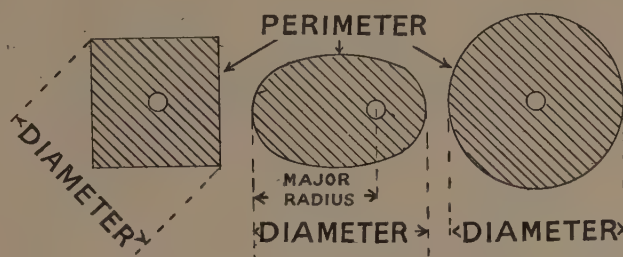
Fig. 2.   Transverse section.
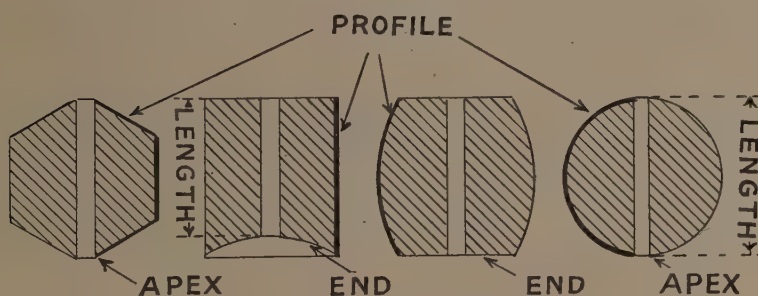
Fig. 3.   Longitudinal section.
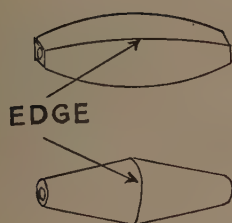
Fig. 4.   Edge.
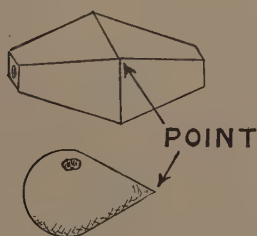
Fig. 5.   Point.

Fig. 6.   Base.

Length.   The length of a bead is the distance between the two ends or apexes of a bead.   That is, the length of a bead is usually the length of the perforation.   Fig. 3.

Edge.   The junction of two facets or surfaces on a bead is called an edge. Fig. 4.

Point.   The meeting-place of three or more facets, or the pointed end of a conical surface, is called a point.   Fig. 5.

Middle.   The middle of a bead is the position equally distant from the two ends or apexes of a bead.

Base.   In beads with V-perforation, in which both ends of the perforation start on the same surface, and in which that surface is approximately flat, that surface is called the base of the bead.   Fig. 6.

Regular bead.   A regular bead is a bead of a relatively simple geometric shape, which can be approximately determined by a transverse and longitudinal section.
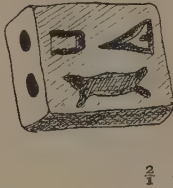
Fig. 7.   Spacing bead. Faience, Egypt, XXVIth Dynasty.

Fig. 8.   Collared bead. Steatite, Egypt, XIIth Dynasty.
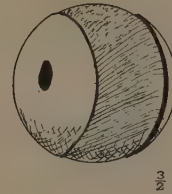
Fig. 9.   Capped bead. Gold and steatite, Egypt, XIIth Dynasty.

Spacing bead.   A spacing bead is a bead with two or more perforations through which strings for carrying other beads can be placed, so that the strings are kept at the correct distance apart.   Fig. 7.

Disc bead.   A disc bead is a regular bead in which the length is less than one-third the diameter of the bead.   Very thin disc beads are sometimes called 'wafer beads'.

Short bead.   A short bead is a regular bead in which the length is more than one-third the diameter of the bead, and less than nine-tenths the diameter.

Standard bead.   A standard bead is a regular bead in which the diameter is approximately the same as the length.   In order to fix it more definitely, it is one which has the length more than nine-tenths and less than one and a tenth times the diameter.

Long beads.   Regular beads in which the length is more than one and a tenth times the diameter are called long beads.

Gadroon or reed.   One of a set of raised convex curved bands, joined at their extremities to form a decorative pattern.   Figs. 11, 12.

Flute.   One of a series of concave bands running longitudinally on the bead.   It differs from a gadroon by being concave, whilst the gadroon is convex. Fig. 13.

Collar.   Any attachment at the end of the perforation, designed to strengthen margins or reduce friction, is called a collar.   Collars may be notched, milled, or plain.   Fig. 8.

Cap.   A metal cover to fit over the end of a bead is called a cap.   Caps may be plain or decorated.   Fig. 9.

		1. Convex.							2. Str...		
		Oblate Disc.	Barrel Disc.	Convex Cone Disc.	Convex Truncated Cone Disc.	Convex Bicone Disc.	Convex Truncated Bicone Disc.	Pear-shape Disc	Cylinder Disc.	Cone Disc.	Truncated Cone Dis...
DISC BEADS. Length less than ⅓ diameter	Longitudinal Section	A.1.a.	A.1.b.	A.1.c	A.1.d.	A.1.e.	A.1.f.	A.1.g.	A.2 b.	A.2.c	A.2.d
	Group I Circular	I.A.1.a.	I.A.1.b.	I.A.1.c.	I.A.1.d.	I.A.1.e.	I.A.1.f.	I.A.1.g.	I.A.2.b.	I.A.2.c.	I.A.2.c.
	Group IX. Square.	IX.A.1.a.	IX.A.1.b.	IX.A.1.c.	IX.A.1.d.	IX.A.1.e.	IX.A.1.f	IX.A.1.g.	IX.A.2.b	IX.A.2.c.	IX.A.2.
		Oblate	Short Barrel.	Short Convex Cone	Short Truncated Convex Cone.	Short Convex Bicone.	Short Truncated Convex Bicone	Short Pear-shape	Short Cylinder	Short Cone.	Short Trunca... Cone
SHORT BEADS. Length more than ⅓, and less than ⁹⁄₁₀ diameter	Longitudinal Section.	B.1.a	B.1.b	B.1.c.	B.1.d.	B.1 e.	B.1.f	B.1.g.	B.2 b.	B.2.c.	B.2.d
	Group I Circular.	I.B.1.a.	I.B.1.b.	I.B.1.c.	I.B.1.d.	I.B.1.e.	I.B.1.f.	I.B.1.g.	I.B.2.b.	I.B.2.c	I.B.2.c
	Group IX Square.	IX.B.1.a.	IX.B.1.b.	IX.B.1.c.	IX.B.1.d.	IX.B.1.e.	IX.B.1.f.	IX.B.1.g.	IX.B.2.b.	IX.B.2.c.	IX.B.2.
		Circular	Standard Barrel.	Standard Convex Cone	Standard Truncated Convex Cone.	Standard Convex Bicone.	Standard Truncated Convex Bicone.	Standard Pear-shape	Standard Cylinder	Standard Cone	Standard Truncated Cone
STANDARD BEADS Length more than ⁹⁄₁₀ and less than 1¹⁄₁₀ diameter	Longitudinal Section	C.1.a	C.1.b	C.1.c	C.1.d	C.1.e	C.1.f	C.1.g	C.2 b	C.2.c.	C.2.c
	Group I Circular	I.C.1.a	I.C.1.b	I.C.1.c.	I.C.1.d	I.C.1.e	I.C.1.f	I.C.1.g	I.C.2.b	I.C.2.c	I.C.2.c
	Group IX Square	IX.C.1.a	IX.C.1.b	IX.C.1.c.	IX.C.1.d	IX.C.1.e	IX.C.1.f.	IX.C.1.g.	IX.C.2.b.	IX.C.2.c.	IX.C.2.
		Ellipsoid	Long Barrel	Long Convex Cone	Long Truncated Convex Cone	Long Convex Bicone	Long Truncated Convex Bicone	Long Pear-shape	Long Cylinder	Long Cone.	Long Truncated Cone
LONG BEADS Length more than 1¹⁄₁₀ diameter	Longitudinal Section	D.1 a	D.1 b	D.1.c	D.1.d	D.1.e	D.1.f.	D.1.g.	D.2.b.	D.2.c	D.2.d
	Group I Circular	I.D 1.a	I.D.1.b.	I.D 1.c.	I.D.1.d.	I.D.1.e	I.D.1.f	I.D.1.g.	I.D.2.b.	I.D.2.c.	I.D.2.
	Group IX Square	IX.D.1.a.	IX.D.1.b.	IX.D.1.c.	IX.D.1.d	IX.D.1.e.	IX.D.1.f.	IX.D.1.g.	IX.D.2.b.	IX.D.2.c.	IX.D.2.

...h t.				3 Concave					4. Convex and Straight.		5. Straight and Concave.	
Disc	Truncated Bicone Disc	Chamfered Cylinder Disc.	Double Chamfered Cylinder Disc.	Concave Disc.	Concave Cone Disc	Concave Truncated Cone Disc.	Concave Bicone Disc	Concave Truncated Bicone Disc.	Cylinder Disc with one Convex End.	Cylinder Disc with two Convex Ends.	Cylinder Disc with one Concave End.	Cylinder Disc with two Concave Ends.
A.2.e	A.2.f	A.2.b.d.	A.2.b.f	A.3.b.	A.3.c.	A.3.d.	A.3.e.	A.3.f	A.4.d.b.	A.4.f b.	A.5.b.d.	A.5.b.f.
I.A.2.e	I.A.2.f	I.A.2.b.d.	I.A.2.b.f	I.A.3.b.	I.A.3.c.	I.A.3.d.	I.A.3.e.	I.A.3.f.	I.A.4.d.b.	I.A.4.f.b.	I.A.5.b.d	I.A.5.b.f.
IX.A.2.e	IX.A.2.f	IX.A.2.b.d.	IX.A.2.b.f	IX.A.3.b	IX.A.3.c.	IX.A.3.d.	IX.A.3.e.	IX.A.3.f.	IX.A.4.d.b.	IX.A 4.f b.	IX.A.5.b.d.	IX.A.5.b.f.
Bicone.	Short Truncated Bicone	Short Chamfered Culinder	Short Double Chamfered Culinder	Short Concave.	Short Concave Cone	Short Truncated Concave Cone.	Short Concave Bicone	Short Concave Truncated Bicone	Short Cylinder with one Convex End	Short Cylinder with two Convex Ends.	Short Cylinder with one Concave End.	Short Cylinder with two Concave Ends.
B 2.e	B 2.f	B.2.b.d	B.2.b.f	B.3.b.	B.3.c	B.3.d	B.3.e.	B.3.f	B 4 d.b	B.4 f b	B.5.b.d	B.5.b.f.
I B 2 e	I B 2.f	I.B.2.b.d	I.B.2.b.f	I.B.3.b.	I.B.3.c	I.B.3.d	I.B.3.e	I.B.3.f.	I.B.4.d.b.	I.B.4.f.b.	I.B.5.b.d.	I.B.5.b.f.
...2.e	IX.B.2.f	IX.B.2.b.d.	IX.B.2.b.f.	IX.B.3.b.	IX.B.3.c.	IX.B.3.d.	IX.B.3.e	IX.B.3.f	IX.B.4.d.b	IX.B.4.f.b.	IX.B.5.b.d.	IX.B.5.b.f.
...dard ...ne	Standard Truncated Bicone	Standard Chamfered Cylinder.	Standard Double Chamfered Cylinder	Standard Concave.	Standard Concave Cone.	Standard Truncated Concave Cone.	Standard Concave Bicone.	Standard Truncated Concave Bicone.	Standard Cylinder with one Convex End.	Standard Cylinder with two Convex Ends.	Standard Cylinder with one Concave End	Standard Cylinder with two Concave Ends
...2.e.	C.2.f.	C.2.b.d.	C.2.b.f.	C.3.b.	C.3.c.	C.3.d.	C.3.e.	C.3.f.	C.4.d.b.	C.4.f.b.	C.5.b.d.	C.5.b f.
...2.e.	I.C.2.f.	I.C.2.b.d.	I.C.2.b.f.	I.C.3.b.	I.C.3.c.	I.C.3.d.	I.C.3.e.	I.C.3.f.	I.C.4.d.b.	I.C.4.f.b.	I.C.5.b.d.	I.C.5.b.f.
...2.e.	IX.C.2.f.	IX.C.2.b.d.	IX.C.2.b.f.	IX.C.3.b.	IX.C.3.c.	IX.C.3.d.	IX.C.3.e.	IX.C.3.f.	IX.C.4.d.b.	IX.C.4.f.b.	IX.C.5.b.d.	IX.C.5.b.f.
...ng ...one.	Long Truncated Bicone.	Long Chamfered Cylinder	Long Double Chamfered Cylinder	Long Concave.	Long Concave Cone.	Long Truncated Concave Cone.	Long Concave Bicone	Long Truncated Concave Bicone	Long Cylinder with one Convex End.	Long Cylinder with two Convex Ends.	Long Cylinder with one Concave End.	Long Cylinder with two Concave Ends.
...2.e.	D.2.f.	D.2.b.d.	D.2.b.f.	D.3.b.	D.3.c.	D.3.d.	D.3.e.	D.3.f.	D.4.d.b.	D.4.f.b.	D.5.b.d.	D.5 b f.
...2.e.	I.D.2.f.	I.D.2.b.d.	I.D.2.b.f.	I.D.3.b.	I.D.3.c.	I.D.3.d.	I.D.3.e.	I.D.3.f.	I.D.4.d.b.	I.D.4.f.b.	I.D.5.b.d.	I.D.5.b.f.
...2.e.	IX.D.2.f.	IX.D.2.b.d.	IX.D.2.b.f.	IX.D.3.b.	IX.D.3.c.	IX.D.3.d.	IX.D.3.e.	IX.D.3.f.	IX.D.4.d.b.	IX.D.4.f.b.	IX.D.5.b.d.	IX.D.5.b.f.

Core. In faience and glazed earthenware beads the original body, which is covered over with glaze, is called the core. This word is also used to denote the backing or support frequently found in beads made of thin sheet gold or other metals.

Matrix. Many glass beads consist of a body of one coloured glass into which are impressed, or on which are superimposed, eyes or threads of different coloured glass. This body is called the matrix.

PART II. CLASSIFICATION

Beads and pendants are divided into four divisions.

Division I. Regular rounded beads.
Division II. Regular faceted beads.
Division III. Special type beads and pendants.
Division IV. Irregular beads and pendants.

These divisions are divided into Groups, Subgroups, Families, and Classes.

DIVISION I. REGULAR ROUNDED BEADS

All regular beads are divided into groups according to their transverse section.

The beads, contained in this division, have a perimeter, which consists entirely of curved lines, or else of curved lines combined with one straight line.

This division is divided into seven groups as follows:

Group I. *Circular.* Beads in which the perimeter is a circle.

These beads are symmetrical round the axis. The great majority of beads belong to this group, which is considered as the type-group of the first division, and many of its various forms are illustrated in pls. II, III.

Group II. *Elliptical.* Beads in which the perimeter is an ellipse.

Group III. *Ovoid.* Beads in which the perimeter approximately consists of the halves of two different ellipses.

Group IV. *Lenticular.* Beads in which the perimeter consists of two curved lines, approximately arcs of circles, which meet at opposite points. When the curved sides meet in a sharp edge, they can be referred to as sharp-edged, but if there is a small flat surface joining the two curved surfaces, they can be called blunt-edged.

Group V. *Plano-convex.* Beads in which the perimeter is approximately the minor segment of a circle. These beads also can be either sharp- or blunt-edged.

Group VI. *Semi-circular.* Beads in which the perimeter is approximately a semi-circle.

Group VII. *Circle and flat.* Beads in which the perimeter is approximately the major segment of a circle.

Division II. Regular Faceted Beads

This division consists of faceted beads, or beads in which the perimeter consists of a series of straight lines. It is divided into nine groups as follows:

Group VIII. *Triangular.* Beads in which the perimeter is a triangle.

Group IX. *Square.* Beads in which the perimeter is a square. This group is taken as the type-group for Division II, and many of its various forms are illustrated in pls. II, III.

Group X. *Rectangular.* Beads in which the perimeter is a rectangle.

Group XI. *Diamond.* Beads in which the perimeter is a diamond.

Group XII. *Pentagonal.* Beads in which the perimeter is a pentagon.

Group XIII. *Hexagonal.* Beads in which the perimeter is a hexagon.

Group XIV. *Octagonal.* Beads in which the perimeter is an octagon.

Group XV. *Polygonal.* Beads in which the perimeter consists of 7, 9, or more sides.

Group XVI. *Tabular.* Beads which have two parallel or nearly parallel surfaces, which surfaces are the principal feature of the bead, and are approximately parallel to the axis.

Pl. I shows a typical transverse section of each of the above sixteen groups. It also shows three beads of each group of the same transverse section as shown, and with three of the most usual longitudinal sections, which are shown at the top of the diagram. The letters, etc., under the beads are described in the next part on the classes.

The above groups are divided into Subgroups, Families, and Classes according to the shape of their longitudinal section, which is the section along the axis showing the greatest distance from the axis to the profile. The maximum width of this section is called the diameter of the bead. When the bead is unsymmetrical this section includes the major radius.

All the above groups are divided into four subgroups, according to length, as follows:

A. *Disc beads,* in which the length is less than one-third the diameter.

B. *Short beads,* in which the length is more than one-third and less than nine-tenths the diameter.

C. *Standard beads,* in which the length is more than nine-tenths and less than one and one-tenth times the diameter.

D. *Long beads,* in which the length is more than one and one-tenth times the diameter.

These subgroups are divided into Families, according to whether the profile is convex, straight, concave, a combination of convex and straight, a combination of straight and concave, or a combination of convex and concave. These families are divided into Classes, according as the profile is parallel or conical.

The families are distinguished by Arabic numerals and the classes by small letters.

The classes are as follows:

Family 1. Beads in which the profile is *convex*.

1 a. Oblate, spherical, and ellipsoid beads, according as the beads are short, standard, or long. In this class the profile meets the perforation.[1]

1 b. Barrel. Beads with flat ends that meet the curved profile at an angle.[1]

1 c. Convex cone. Beads in which the curved profile meets the perforation at one apex.

1 d. Truncated convex cone. Beads in which the curved profile does not meet the perforation, and which therefore have two flat ends.

1 e. Convex bicone. Beads in which the curved line of the profile meets the perforation.

1 f. Truncated convex bicone. Beads in which the curved profile does not meet the perforation, and which therefore have two flat ends.

1 g. Pear-shape. The pear-shape beads in this group have a convex profile of different curvature. Some pear-shape beads have a combination of straight and convex, in which case they belong to family 4; others have a profile combining convex and concave curves, in which case they belong to family 6.

Family 2. Beads in which the profile consists of one or more straight lines.

2 b. Cylindrical. Beads in which the profile consists of one straight line parallel to the axis.

2 c. Cone. Beads in which the profile consists of one straight line which is not parallel to the axis, and which meets the perforation.

2 d. Truncated cone. Beads in which the profile consists of one straight line, which is not parallel to the axis and which does not meet the perforation.

2 e. Bicone. Beads in which the profile consists of two straight lines, at an angle to one another, which meet the perforation.

2 f. Truncated bicone. Beads in which the profile consists of two straight lines at an angle to one another, which lines do not meet the perforation.

2 bd. Chamfered cylinder. A combination of classes 2 b and 2 d.

2 bf. Double chamfered cylinder. A combination of classes 2 b and 2 f.

---

[1] Beads belonging to group I, family 1 a, which are spherical, or only slightly oblate or ellipsoidal, and those belonging to family 1 b, which have small ends and approximate to spheres, are sometimes called *Spheroids*.

Family 3.   Beads in which the profile consists of one or more concave lines.

3 b. Concave.   Beads in which the profile consists of one concave line, and in which the two ends are approximately the same size.

3 c. Concave cone.   Beads in which the profile consists of a concave line which meets the perforation at one end.

3 d. Truncated concave cone.   Beads in which the profile consists of a concave line which does not meet the perforation, but in which one end is decidedly larger than the other.

3 e. Concave bicone.   Beads in which the profile consists of two concave lines, both of which meet the perforation.

3 f. Truncated concave bicone.   Beads in which the profile consists of two concave lines which do not meet the perforation.

Family 4.   Beads in which the profile consists of a combination of convex and straight lines.

4 db. Cylinder with one convex end.   This is a combination of classes 1 d and 2 b.

4 fb. Cylinder with two convex ends.   This is a combination of classes 1 f and 2 b.

Family 5.   Beads in which the profile consists of a combination of straight and concave lines.

5 bd. Cylinder with one concave end.   This is a combination of classes 2 b and 3 d.

5 bf. Cylinder with two concave ends.   This is a combination of classes 2 b and 3 f.

Family 6.   Beads in which the profile consists of a combination of convex and concave lines.

No classes of this family are shown in pls. II, III, but they can be formed in the same way as those in families 4 and 5.

From the foregoing it will be seen that the full description of the form of a regular bead is given by four symbols.   The first is a Roman numeral and denotes the group; the second, a capital letter, denotes the subgroup and length; the third, an Arabic numeral, denotes the family; whilst the fourth is a small letter and denotes the class.

In all cases the same symbol means the same.   The groups show the transverse section.   The subgroup shows the length.   A are disc beads, B are short beads, C are standard beads in which the length and the diameter are approximately equal, and D are long beads.

In the same way the Arabic numerals which denote the families show if

the line of the profile is curved or straight. 1 are convex, 2 are straight, 3 are concave, 4 are convex and straight, 5 are straight and concave, whilst 6 are convex and concave.

In the same way the small letter denoting the class always means the same.

a means that the profile consists of one line which meets the perforation at both ends, so that the bead has two apexes and no 'ends'.

b means that the profile consists of one line which does not meet the perforation at either end, and which is parallel to the axis if the profile is straight; and if the profile is curved, a straight line joining the two ends is approximately parallel to the axis. These bands have two 'ends'.

c means that the bead is conical, and that the profile meets the perforation at one end. These beads therefore have one apex and one 'end'.

d means that the bead is conical, and the profile does not meet the perforation at either end. These beads therefore have two 'ends'.

e means that the bead is a bicone and that the profile consists of two lines which meet the perforation at both ends. These beads therefore have two apexes and no 'ends'.

f means that the bead is a bicone in which the profile does not meet the perforation at either end. These beads therefore have two 'ends'.

g means that the bead is pear-shaped.

In families 4, 5, and 6, of which all the beads are combinations of two of the families 1, 2, or 3, it is possible to describe them by using the two small class letters describing the beads which they combine, always putting the class in the lower numbered family first. Thus in family 4 a combination of 1 b and 2 c would be 4 bc, and a combination of 1 f and 2 b would be 4 fb.

Pls. II, III show a typical section in each class in families 1, 2, and 3, and some classes in families 4 and 5. They also show a bead of this section belonging to group I and group IX : under each bead are the correct symbols to describe it.

These plates also show that, as the diameter of a bead is the greatest width of the transverse section, the diameter of a square bead is equal to the diagonal of the square, and therefore a standard square bead has a length approximately equal to its diagonal. In other words, the standard square bead is the square bead that could be cut out of a standard cylinder of circular section.

In the above cases the 'ends' of beads may be flat or slightly concave or hollow conical—that is to say, a part of a cone in which the smaller portion of the cone is nearer the centre of the bead. If, however, their surface has a deep hollow cone, it is generally best to consider it as part of the perforation. See perforation types 1, 3, and 5.

If the 'ends' are so convex or conical—that is to say, part of a cone in which the smaller part of the cone is farther from the centre of the bead—that

they become a feature of the bead, they should not be considered as 'ends' but as a part of the profile of the bead.

The ends of beads are sometimes specially shaped. Some tubular beads have the ends ground alternately convex and concave, so as to fit together. Some others have a very deep concave end. In this case it is best to describe the bead, if otherwise regular, under its correct class and note that the end is very concave.

Many of the beads in the foregoing groups can be modified in various ways as follows:

Collared beads. Many regular beads can have collars, in which case they can be described as of the class to which they would belong if they had no

Fig. 10.   Wedge bead.
Amber, Anglo-Saxon.
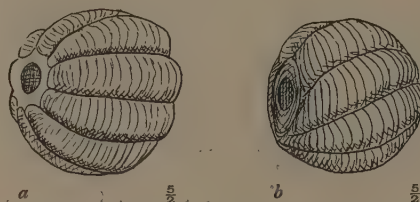
Fig. 11.   Melon beads. *a*, Faience, Egypt, XVIIIth Dynasty; *b*, Glass, Egypt, Roman Period.

collar, and then the word 'collared' can be added. The bead shown in fig. 8, is II. C. 1. a, collared.

Capped beads. Some regular-shaped beads have caps fitted to them, in which case they can be described as if the cap were not there, and then the word 'capped' can be added. The bead shown in fig. 9, is I. C. 1. a, capped.

Wedge beads. Beads of large diameter often have the two ends at an angle to one another like the keystone of an arch. This is generally done to enable a number of them strung together to hang in a circle. Such beads can be described as if they were not wedge-shaped, and then the word 'wedge' can be added. The bead shown in fig. 10 is a rather irregular specimen of VII. B. 2. b, wedge.

Gadrooned beads. Another way in which regular beads can be modified is by being gadrooned or reeded. The number of gadroons varies from three or four to as many as twenty-five or thirty.

The fact that these beads are gadrooned is generally more important than the shape, so although the shape can be described by the letters and numbers used in Division I, the beads have all been included in group XXIII, Notched and gadrooned beads and pendants. Two of the commonest forms are the *melon bead* (fig. 11) and the gadrooned bicone (fig. 12).

The gadroons can also be *spiral*, in which case, if the spiral is only slight,

they are included in group XXIII.   Fig. 11, b shows a spiral melon bead.   If, however, the spiral is great, it is best to include them in group XVIII, Spiral beads and pendants.

Fluted beads.   Regular beads can also be fluted.   In this case the groove is concave, and there is sometimes a sharp line or rib where the flutes join.

Beads modified in this way are treated in the same way as gadrooned beads.

Spiral faceted beads.   Another way in which regular faceted beads are modified is for the facets to go spirally round the bead instead of straight (fig. 14).   These can be described in the ordinary way with the addition of the word 'spiral'.
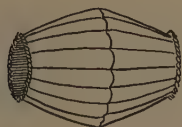
Fig. 12.   Gadrooned bicone bead.   Gold, Cyprus, 500 B.C.
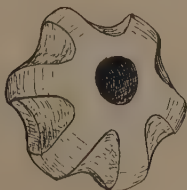
Fig. 13.   Fluted bead.   Turquoise, Peru, *c.* 1500 A.D.
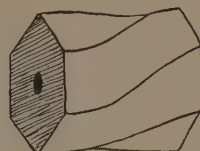
Fig. 14.   Spiral faceted bead.

Division III.   Special Type Beads and Pendants

This division includes the more elaborate types of beads, the pendants, and perforated seals.   It is very difficult to divide it satisfactorily into Groups, Subgroups, and Families.   The difficulty is greatly increased by the inclusion of pendants and the fact that it is almost impossible to draw a hard and fast line between what is a bead and what is a pendant.   In many cases an exactly similar object becomes a definite bead or a definite pendant, according to its perforation.   For instance, an olive shell perforated along the axis is a bead, whilst the same shell perforated at one end is a pendant (see fig. 25, A. 1, B. 1).

Each group is therefore divided into two subgroups, subgroup A being for beads, and subgroup B for pendants.   Each subgroup is divided into similar families; similar objects in each group belonging to families of the same number. For instance, the shells referred to above both belong to family 1 of group XXVII; the bead belongs to family XXVII. A. 1, which contains beads consisting of complete shells, whilst the pendant belongs to family XXVII. B. 1, which contains pendants consisting of complete shells.

The only disadvantage of this method is that the families in some of the subgroups are not consecutively numbered, some families in subgroup A not being represented in subgroup B, and vice versa.

This division is divided into thirty-two groups as follows:

Group XVII.   Multiple beads.
Group XVIII.   Spiral beads and pendants.
Group XIX.   Special faceted beads.
Group XX.   Annular and wheel pendants.
Group XXI.   Bullae.
Group XXII.   Simple pendants.
Group XXIII.   Notched beads and pendants.
Group XXIV.   Filigree and lattice-work beads and pendants.
Group XXV.   Granulated beads and pendants.
Group XXVI.   Beads and pendants representing or made of flowers, fruits, seeds, or leaves.
Group XXVII.   Beads and pendants representing or made of complete shells.
Group XXVIII.   Beads and pendants representing weapons or tools.
Group XXIX.   Beads and pendants representing emblems.
Group XXX.   Beads and pendants representing human beings or human-headed deities.
Group XXXI.   Beads and pendants representing or made of parts of human beings.
Group XXXII.   Beads and pendants representing animals or animal-headed deities.
Group XXXIII.   Beads and pendants representing birds or bird-headed deities.
Group XXXIV.   Beads and pendants representing reptiles, insects, etc., or deities with heads of reptiles, insects, etc.
Group XXXV.   Beads and pendants representing or made of parts of animals, birds, reptiles, insects, etc.
Group XXXVI.   Scarabs.
Group XXVII.   Cylinder seals.
Group XXXVIII.   Ball seals.
Group XXXIX.   Cone seals.
Group XL.   Lenticular seals.
Group XLI.   Button seals.
Group XLII.   Button beads and toggle beads.
Group XLIII.   Elaborate medieval carved beads.
Group XLIV.   Elaborate jewelled pendants of the Middle Ages and Renaissance.
Group XLV.   Netsukés.
Group XLVI.   Spot beads and eye beads and pendants with circular eyes.
Group XLVII.   Zone, striped, wave, and chevron beads.
Group XLVIII.   Sundry beads and pendants.

These groups are arranged primarily according to the shape of the beads. In some cases, however, the decoration or inscription is so much more important, that they have been grouped according to that. The chief instances where this has been done are the seals and scarabs (groups XXXVI–XLI), the spot and eye beads (group XLVI), and the zone, striped, wave, and chevron beads (Group XLVII).

Group XVII. *Multiple Beads*

This group is divided as follows :

Subgroup A. Beads.

Family A. 1. *Segmented beads.*

a. Small, not more than ¼ in. diameter. Fig. 15, A. 1. a.

b. Large, more than ¼ in. diameter. Fig. 15, A. 1. b.

These two classes contain beads which are very different, but they merge almost imperceptibly from one to the other. The larger beads are usually more like separately made beads joined together, and were sometimes used for cutting into separate beads.

Family A. 2. *Multitubular beads.*

a. Beads of faience, glass, or metal tubes with the axes in one plane. Fig. 15, A. 2. a.

b. Beads of faience, glass, or metal tubes with the axes in different planes. Fig. 15, A. 2. b.

c. Beads carved out of stone, amber, etc., in imitation of multitubular beads. Fig. 15, A. 2. c.

d. Multiple cross-spacing beads. Fig. 15, A. 2. d.

These are multitubular beads arranged so as to act as spacing beads in two directions.

Family A. 3. *Rectangular, elliptical, and lenticular spacing beads, in which the axes of the perforations are parallel.*

The majority of the spacing beads belonging to this family are included in the following classes :

a. *Rectangular spacing beads.*

In these the transverse section is a rectangle.

1. Cylinder. Fig. 7.
2. Oblate, Circular, and Ellipsoidal.
3. Disc. Fig. 15, A. 3. a. 3.

b. *Elliptical spacing beads.*

In these the transverse section is an ellipse, or an ellipse with flattened sides.

1. Cylinder. Fig. 15, A. 3. b. 1.

2. Oblate, circular, and ellipsoidal.   Fig. 15, A. 3. b. 2.
3. Disc.

c. *Lenticular spacing beads*.
1. Cylinder.
2. Oblate, circular, and ellipsoidal.
3. Disc.   Fig. 15, A. 3. c. 3.

A. 1. a. $\frac{4}{1}$ A. 1. b. $\frac{5}{4}$ A. 2. a. $\frac{2}{1}$ A. 2. b. $\frac{2}{1}$ A. 2. d. $\frac{1}{1}$

A. 2. c. $\frac{3}{2}$ A. 3. a. 3. $\frac{1}{1}$ A. 3. b. 1. $\frac{2}{3}$ A. 3. b. 2. $\frac{2}{1}$ A. 3. c. 3. $\frac{3}{2}$ A. 3. d. 3. $\frac{3}{2}$
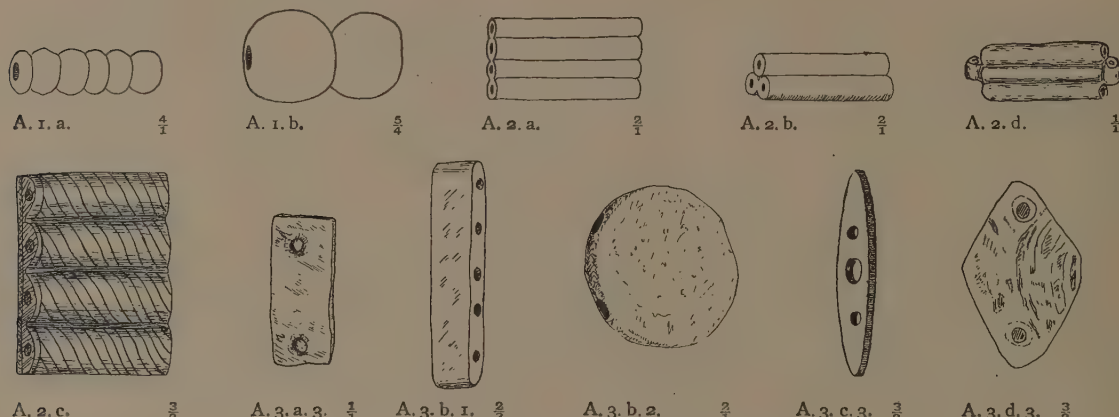
Fig. 15.   GROUP XVII.   Multiple and Spacing Beads.

A. 1. a. Small segmented bead.   Faience, Egypt, XVIIIth Dynasty.
A. 1. b. Large segmented bead.   Glass, Irish, Celtic.
A. 2. a. Multitubular bead.   Faience, Egypt, XIXth Dynasty.
A. 2. b. Multitubular bead.   Faience, Egypt, XIXth Dynasty ?
A. 2. c. Carved multitubular bead.   Lapis, Egypt, XIIth Dynasty.
A. 2. d. Multiple cross spacing bead.   Faience, Tel el Amarna, XVIIth Dynasty.
A. 3. a. 3. Rectangular disc spacing bead.   Mother of pearl, Egypt, XIIth Dynasty.
A. 3. b. 1. Elliptical cylinder spacing bead.   Stone, Ur, 3500 B. C.
A. 3. b. 2. Elliptical circular spacing bead.   Faience, Ur, 2000 B. C. ?
A. 3. c. 3. Lenticular disc spacing bead.   Shell, Ur.
A. 3. d. 3. Lozenge disc spacing bead.   Shell, Ur, Early Period ?

d. *Lozenge or diamond spacing beads*.
1. Cylinder.
2. Oblate, circular, and ellipsoidal.
3. Disc.   Fig. 15, A. 3. d. 3.

Family A. 4.   *Terminal spacing beads*.   Fig. 44.

These beads have the perforations nearer together at one end or have fewer perforations at one end than at the other.

The spacing beads in families 3 and 4 are those of regular or simple designs, which from their shape and decoration do not fall into other groups of Division III.

Many spacing beads of an elaborate nature are classed in various groups according to their design, as for instance the flower and leaf pendants in group XXVI and the teeth with double perforation in group XXXV, etc.

Subgroup B. Pendants.

There is a great number of multiple pendants, but these usually consist of several representations of some emblem or figure. For this reason they are not placed in this group, but are placed in the same group as a pendant of a single representation of the same emblem or figure.
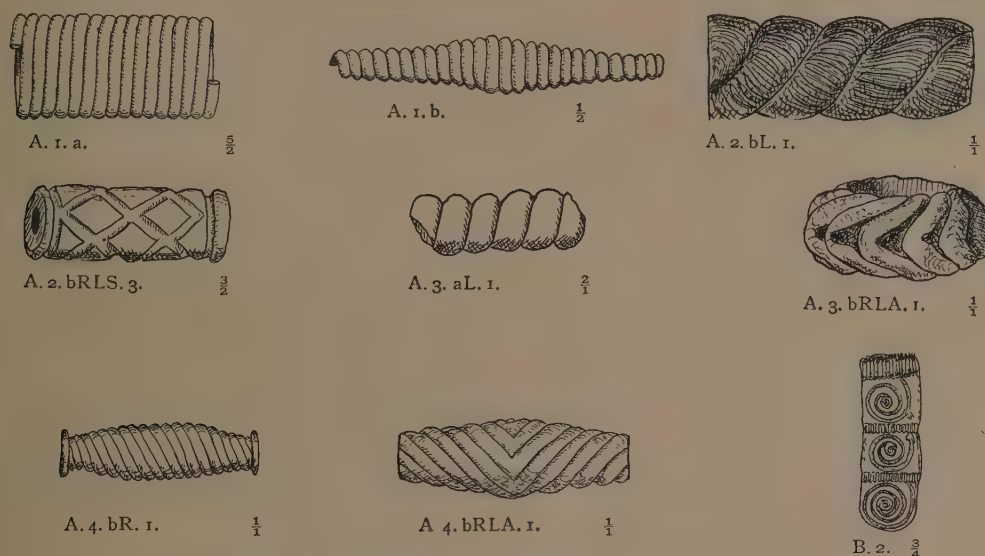
Fig. 16. GROUP XVIII. Spiral Beads and Pendants.

A. 1. a. Spiral wire bead. Gold, Cyprus, 500 B. C.
A. 1. b. Spiral wire bead. Bronze, Italy, 9th century B. C.
A. 2. bL. 1. Moulded spiral bead. Faience, Hierakonpolis, Ist Dynasty.
A. 2. bRLS. 3. Bead with superimposed spirals. Faience, Ur, before 600 B. C.
A. 3. aL. 1. Wound spiral bead. Glass, Crimea, Greek Period.
A. 3. bRLA. 1. Wound spiral bead. Glass, Ireland, Celtic ?
A. 4. bR. 1. Carved spiral bead. Amber, Praeneste, 800 B. C.
A. 4. bRLA. 1. Carved bead with adjacent spirals. Amber, Etruscan, 800 B. C.
B. 2. Moulded spiral pendant. Glass, Rhodes, 1300 B. C.

Group XVIII.   *Spiral Beads and Pendants*

Subgroup A.   Beads.

Family A. 1.   *Spiral wire beads.*

a. *Parallel.* Fig. 16, A. 1. a.

b. *Bicone.* Fig. 16, A. 1. b.

c. *Spherical and ellipsoidal.*

These beads are made by winding wire in coils. They are usually made of metal, but are also made of glass, wax, etc. In some cases the wire may be lightly fused together to keep it in position, but it must not be melted into a solid mass, so that the shape of the wire, inside or outside, is lost.

Family A. 2.   *Moulded or painted spiral beads in faience and pottery.*

Family A. 3.   *Moulded, wound, or enamelled spiral beads in glass.*
Family A. 4.   *Carved, glazed, etc., spiral beads in stone, amber, etc.*

These three families can be divided as follows :

a. *Single spirals.*

R. Right-hand.
  1. Raised.
  2. Flush.   Fig. 69.
  3. Incised.
L. Left-hand.
  1. Raised. Fig. 16, A. 3. aL. 1.
  2. Flush.   Fig. 83.
  3. Incised.

b. *Multiple spirals.*

R. Right-hand.
  1. Raised. Fig. 16, A. 4. bR. 1.
  2. Flush.
  3. Incised.

L. Left-hand.
  1. Raised. Fig. 16, A. 2. bL. 1.
  2. Flush.
  3. Incised.
RLA. Right- and left-hand adjacent spirals.
  1. Raised. Fig. 16, A. 3. bRLA. 1, and A. 4. bRLA. 1.
  2. Flush.
  3. Incised.
RLS. Right- and left-hand spirals superimposed.
  1. Raised.
  2. Flush.
  3. Incised.   Fig. 16, A. 2. bRLS. 3.

Family A. 5.   *Beads with helical designs.*   Fig. 70.
The spiral eye beads might have been included in this family, but I think it better to put them with the other eye beads in group XLVI.

Subgroup B.   Pendants.

A certain number of spiral beads and pendants is not included in this group, as these fall more appropriately elsewhere. Amongst the beads in addition to the spiral eye beads mentioned above, are the spiral gadroon beads, included in group XXIII, and the spiral faceted beads referred to on page 11. In the same way there are a number of pendants with spiral gadroons, which, except that the gadroons are spiral instead of straight, are exactly similar to the gadroon pendants in family B of group XXIII. They are therefore included in that group.   In this subgroup there are, however, the following families :

Family B. 1.   *Spiral wire pendants.*
Family B. 2.   *Moulded spiral pendants.*
Included in this family are a series of curious flat moulded glass pendants, with a number of spirals on the face. These come from Mycenae and Ialysos (fig. 16, B. 2). In some cases the whole pendant is moulded in the form of a spiral.
Family B. 3.   *Carved spiral pendants.*

Group XIX. *Special Types of Faceted Beads*

Family A. 1. *Cornerless cubes.* Fig. 17, A. 1.

These beads are cubes or rectangles which have had all their corners cut off so as to leave triangular surfaces. They are the combination of a cube and an octagon.

A. 1. $\frac{4}{1}$ A. 4. $\frac{2}{1}$ A. 5. a. $\frac{1}{1}$ A. 5. b. $\frac{1}{1}$

A. 8. a. $\frac{1}{1}$ A. 8. c. $\frac{1}{1}$ A. 9. $\frac{1}{1}$
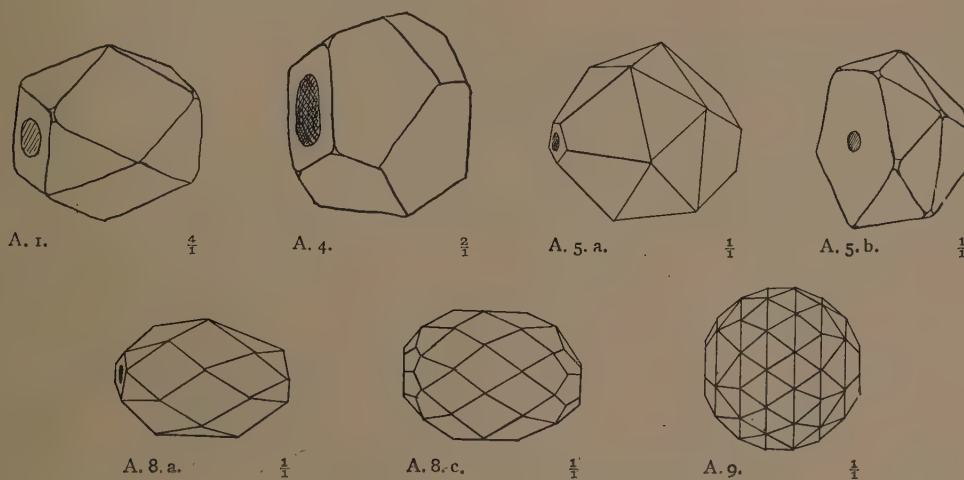
Fig. 17. GROUP XIX. Special Types of Faceted Beads.

A. 1. Cornerless cube bead. Glass, Crimea, 500 B.C.
A. 4. Twisted square bead. Glass, Egypt, Roman Period.
A. 5. a. Double pentagon bead. Crystal, Anglo-Saxon.
A. 5. b. Flattened double pentagon bead. Crystal, Anglo-Saxon.
A. 8. a. Lozenge pentagon bead. Crystal, Anglo-Saxon.
A 8. c. Lozenge octagon bead. Crystal, Modern.
A. 9. Multifaceted bead. Crystal, Modern.

Family A. 2. *Tetrahedron.*

There are two classes of these, which, although they are of the same shape, are perforated differently.

a. Perforated from a point to the centre of the opposite surface.

b. Perforated from the centre of one edge to the centre of the edge opposite.

Family A. 3. *Dodecahedron.*

Family A. 4. *Twisted square.* Fig. 17, A. 4.

These beads are made like a square bicone bead, IX. C. 2. f, but the facets which point to one end are rotated 45 degrees with reference to the facets which point to the other end. The crystallographic name for this is a truncated tetragonal trapezohedron, but I think the name 'twisted square' is more descriptive and easier.

Family A. 5. *Double pentagon.* Fig. 17, A. 5. a.

These beads have twenty facets. There are five at each end and each of these facets has four edges. The facets make a considerable angle with the

axis. As in the twisted square, the facets at two ends are arranged so that the edges of the facets at one end are opposite the middle of those at the other end. On the top of each of these four-sided facets is a triangular facet, of which the base adjoins the four-sided facet at one end, and the apex adjoins the edge between the two facets at the other end. In this way there are five four-sided facets at each end and ten triangular facets in between them.

It is usual for these beads to be shorter than the diameter and for the four-sided facets at one end to make a greater angle with the axis than do those at the other end. In some cases the angles at one end become practically a right angle, and the five facets become almost or quite a single flat pentagonal surface. Such beads are called Flattened Double Pentagons (fig. 17, A. 5. b). A rare special form is when the four-sided facets meet at an apex so as to form equilateral triangles, and the intermediate triangles are also equilateral: in this case the bead becomes an icosahedron.

Family A. 6. *Double hexagon.*

These are similar to the double pentagons in family A. 5, but have six facets round each end instead of five.

Family A. 7. *Double octagon.*

These are similar to the double pentagons in family A. 5, but have eight facets round each end instead of five.

Family A. 8. *Lozenge faceted beads.*

a. *Lozenge pentagon.* Fig. 17, A. 8. a. These beads have five 'lozenge' or diamond-shaped facets round the perimeter, arranged so that the obtuse angles of the lozenges are touching. In between each pair of facets, are further lozenge-shaped facets extending from the centre to the ends. At the end between this second row of lozenge facets is a row of triangular facets. The bead therefore has fifteen lozenge-shaped and ten triangular facets.

b. *Lozenge hexagon.* These beads are made on the same principle as the beads A. 8. a, but there are six lozenge-shaped facets round the perimeter instead of five. Also the facets which correspond to the triangular facets are generally lozenge-shaped, or at any rate more than triangles, in which case a further row of facets appears at the ends.

c. *Lozenge octagon.* Fig. 17, A. 8. c. These beads are made on the same principle as the beads A. 8. a, but there are eight lozenge-shaped facets round the perimeter instead of five. In this case the triangular facets become lozenge-shaped facets, in which the angle near the end is much more obtuse than the one near the centre, and the further rows of facets at the ends are lozenge-shaped or five-sided.

Family A. 9. *Beads with many triangular facets.*

There are a number of methods of cutting approximately spherical beads

with large numbers of triangular facets. One method in which there are twelve triangular facets round the perimeter is shown in fig. 17, A. 9.

Group XX. *Annular and Wheel Beads and Pendants.*

Subgroup A. Beads.

Family A. 1. *Annular beads.*

a. *Annular beads of circular section.* Fig. 18, A. 1. a. These beads are like

A. 1. a. $\frac{1}{1}$ A. 1. b. $\frac{1}{2}$ A. 1. c. $\frac{1}{1}$ A. 1. d. $\frac{1}{1}$ B. 2. $\frac{1}{1}$

A. 2. a. $\frac{5}{4}$ A. 3. $\frac{1}{1}$ B. 1. a. $\frac{2}{1}$ B. 1. b. $\frac{3}{4}$ B. 1. c. $\frac{1}{1}$
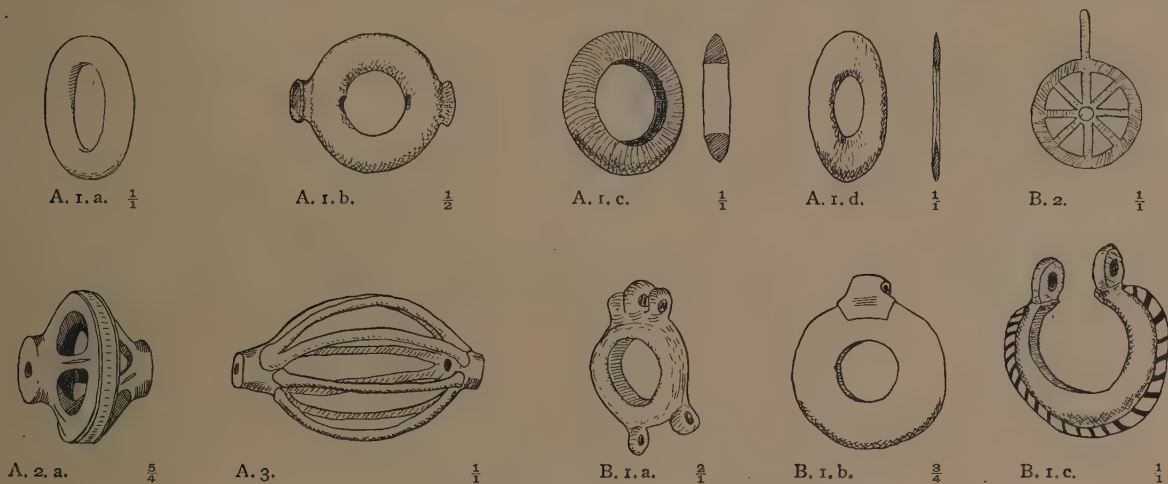
Fig. 18. GROUP XX. Annular and Wheel Beads and Pendants.

A. 1. a. Annular bead. Glass, Egypt, Roman Period.
A. 1. b. Pierced annular bead. Bronze, Ireland, Bronze Age.
A. 1. c. Quoit bead. Faience, English, Bronze Age.
A. 1. d. Flattened annular bead. Amber, England, 100 B.C.
A. 2. a. Wheel bead. Faience, Mycenae, 1300 B.C.
A. 3. Lantern bead. Faience, Egypt, XIIth Dynasty.
B. 1. a. Quoit spacing bead. Faience, Egypt, XVIIIth Dynasty.
B. 1. b. Quoit pendant. Faience, England, Bronze Age.
B. 1. c. Split annular pendant. Glass, Egypt, XVIIIth Dynasty.
B. 2. Wheel pendant. Assyria, 650 B.C.

rings. The longitudinal section consists of two circular or nearly circular portions, one on each side of the axis. These beads are a special form of oblate disc bead, I. A. 1. a.

b. *Pierced annular beads.* Fig. 18, A. 1. b. These beads are similar to the beads in the last class, but they are also perforated at right angles to the axis. They are frequently made out of thin metal, and are then hollow, and they sometimes have collars. These beads vary much in size, and many of the largest ones were used as brooches.

c. *Quoit beads.* Fig. 18, A. 1. c. Beads in which the longitudinal section consists of two triangles with slightly curved sides, one on each side of the axis,

and in which the perforation is more than half the diameter of the bead. They are a special case of disc bicone, I. A. 1. e.

d. *Flattened annular beads.* Fig. 18, A. 1. d. Beads in which the longitudinal section consists of two lenticular portions, one on each side of the axis, and in which the smallest width of the lenticular section is the length of the bead. They are a special case of disc bicone, I. A. 1. e. Usually the length of the bead is extremely small compared to the diameter.

Family A. 2. *Wheel beads.*

These beads have a rim connected to one or two centre-pieces, generally by means of spokes.

a. *Faience wheel beads with two hubs.* Fig. 18, A. 2. a. In this form they have five spokes joining the rim to each end or hub.

b. *Wheel beads with spokes and single hub.* These beads are made of stone, bronze, and bone. They usually have four or six spokes connecting the rim with the central hub.

c. *Wheel beads with circular holes.* Fig. 45. These beads are made like disc wheels with circular holes through the disc. They are usually cast in bronze.

Family A. 3. *Lantern beads.* Fig. 18, A. 3.

These beads have small ends which are connected together by a number of threads of faience, which bend outwards in the middle so as to form a hollow lantern.

Subgroup B. Pendants.

Family B. 1. *Annular pendants.*

a. *Quoit spacing beads.* Fig. 18, B. 1. a. These are annular or quoit-shaped rings with small rings for suspension, and for passing threads through on opposite sides of the main ring.

b. *Quoit pendants.* Fig. 18, B. 1. b. These pendants consist of an annular or quoit-shaped ring, which has a projection attached to one side of it through which is the perforation for suspension. Occasionally the perforation goes through the edge of the ring and there is no projection.

c. *Split annular pendants.* Fig. 18, B. 1. c. These pendants consist of an annular ring with a small gap in it. At each side of the gap are lugs which are pierced for suspension. This class of pendant was usually made of glass, several kinds of glass being used in the same one. They are almost always Egyptian of the XVIIIth Dynasty, and were probably used as earrings.

Family B. 2. *Wheel pendants.* Fig. 18, B. 2.

These pendants consist of a wheel-shaped disc with a long projection for suspension.

Group XXI. *Bullae*

Bullae consist of a disc, generally with a design on it, with a projection at the top, which is perforated for suspension. They frequently formed the centre of necklaces.

Family B. 1. *Moulded bullae.*

a. *Glass bullae.* Fig. 19, B. 1. a.

b. *Faience bullae.*

Family B. 2. *Carved bullae.*

a. *Carved bullae with designs.* Fig. 19, B. 2. a. These are carved in jet, amber, and various stones. The designs are of all sorts; frequently heads are

B. 1. a.   ⅔   B. 2. a.   ⅞   B. 2. b.   ⅔   B. 3.   ¾   B. 4.   ¾
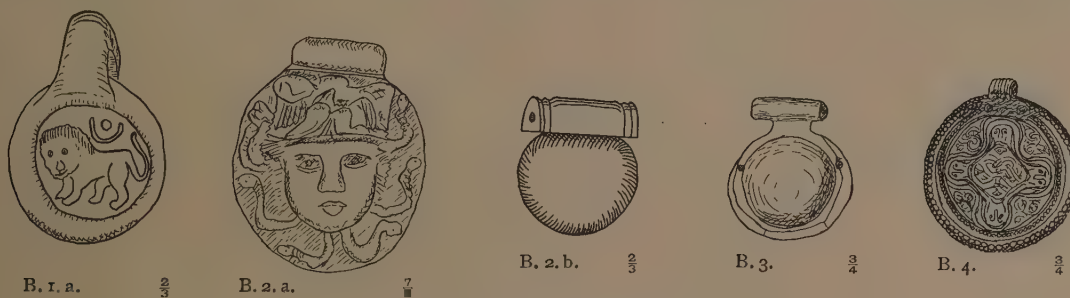
Fig. 19. GROUP XXI. Bullae.

B. 1. a. Moulded bulla. Glass, Syrian, Roman Period.
B. 2. a. Carved bulla. Jet, Yorkshire, Roman Period.
B. 2. b. Carved bulla. Amber, Italy, 800 B. C.
B. 3. Metal bulla. Gold, Italy, 700 B. C.
B. 4. Bracteate. Gold, Anglo-Saxon.

shown, as in the figure. In such cases it is a question whether they should be included here or in group XXXI, family B. 1. pendants representing the head and face. Unless the shape is very definitely the shape of a bulla, it is better to include it in group XXXI.

b. *Carved bullae without designs.* Fig. 19, B. 2. b. The special form of these illustrated has the disc about half as thick as the diameter, and has rounded edges. It is not decorated. These pendants are found in Italy, and may be representations of the sun; if this is so, they should not be included here, but in group XXIX, family B. 2.

Family B. 3. *Metal bullae.* Fig. 19, B. 3.

These are of several forms. In one they are hollow discs hammered out of sheet metal, the back and front being riveted together, and forming a top similar in shape to the amber bullae of the last family.

In another form they are plain convex discs, with or without a design upon them, and with a hole at the top for suspension.

Family B. 4.   *Bracteates.*   Fig. 19, B. 4.

These are flat metal discs rather similar to coins, with a projection at the top, bent over, or riveted on for suspension.

They occur frequently in the Saxon and Merovingian period, and form a sufficiently definite group to put them in a different family from the metal bullae in family 3.

Group XXII.   *Simple Pendants*

Most of the pendants in this group consist of a number of simple forms derived from regular beads, but pierced so as to make them pendants. But some, as those in class B. 1. f, although derived from a simple form, are themselves very elaborate.

Family B. 1.   *Ball pendants.*

a. *Hollow metal ball pendants.*   Fig. 20, B. 1. a.   These pendants are made of thin metal and have a ring fixed into them for suspension.

b. *Solid metal ball pendants.*   Fig. 20, B. 1. b.   These pendants are cast solid, and sometimes have a long projection for suspension, similar to the one illustrated.

c. *Solid faience and stone balls, with projection for suspension.*   Fig. 20, B. 1. c.   These are perforated through the projection.

d. *Hollow faience ball pendants.*   These are hollow faience balls of large size, with only one hole in them, through which a toggle attached to a cord was passed for suspension.   The best-known form of these are the sector globe faience beads.   Fig. 84.

e. *Crystal or stone balls in mount.*   Fig. 20, B. 1. e.   One form of these pendants consists of a circular ball of stone or crystal, mounted in a metal mount, made by bending two strips of metal round the ball at right angles to one another, joining the strips together where they cross, and attaching a ring for suspension at one end.

f. *Oriental ivory ball pendants.*   Fig. 20, B. 1. f.   There are two well-known forms of these: (1) in which the ivory is carved away through holes on the outside, so as to leave a series of loose balls inside; (2) in which the ball is left almost solid, but has a series of holes undercut in it in such a way that the pieces of ivory left from the centres of the holes are too large to come out, and being pointed at one end give the appearance of a large number of loose prickles on it.

Family B. 2.   *Drop pendants.*

a. *Plain drops with pointed tops.*   Fig. 20, B. 2. a.   There are many varieties of these.   They can be either circular or elliptical in section.   They frequently have gold caps or gold bands round them.

b. *Plain drops with rounded ends or rings for suspension.* Fig. 20, B. 2. b. There are many forms of these pendants. Great variety is given to them by adding terminal drops of small size.

c. *Hollow drop pendants.* Fig. 20, B. 2. c. There are several types of these. The curious form illustrated is hammered out so that whilst leaving a thick loop
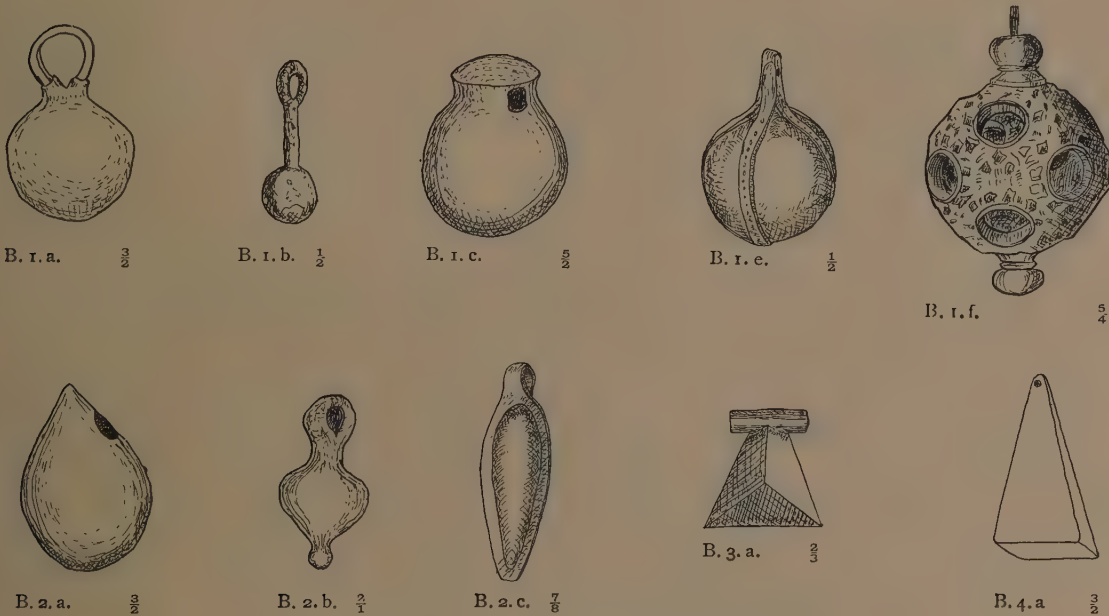
Fig. 20. Group XXII. Simple Pendants.

B. 1. a. Hollow metal ball pendant. Bronze, Crimea, 600 B. C.
B. 1. b. Solid metal ball pendant. Bronze, Italy, Bronze Age.
B. 1. c. Stone ball pendant. Carnelian, Egypt, XIIth Dynasty.
B. 1. e. Crystal ball in bronze mount. Anglo-Saxon.
B. 1. f. Ivory ball pendant. Japan, 19th century.
B. 2. a. Drop pendant. Carnelian, Egypt.
B. 2. b. Drop pendant. Glass, Egypt, Roman Period.
B. 2. c. Hollow drop pendant. Bronze, Italy, 9th century B. C.
B. 3. a. Triangular faceted drop pendant. Amber, Italy, 800 B. C.
B. 4. a. Pyramid pendant. Glass, England, Roman Period.

for suspension, the sides are extremely thin. The tip on one side was longer than the other and bent over to fasten the two sides together. These should perhaps be included amongst bullae, as there seems no definite line of division between them, but I think that they are too far from circular.

Family 3. *Faceted drop pendants.*

a. *Triangular faceted drop pendants.* Fig. 20, B. 3. a. These pendants carved in amber are found in Italy. They do not seem to represent any emblem and so have been included here.

Family B. 4.   *Pyramid pendants.*
 a. *Perforated at the small end.*   Fig. 20, B. 4. a.
 b. *Perforated at the large end.*
Family B. 5.   *Cone pendants.*
These are similar to the pendants in family B. 4, but they are circular in section.
 a. *Perforated at the small end.*
 b. *Perforated at the large end.*
Family B. 6.   *Rod pendants.*
These are rods or cylinders perforated towards one end, at right angles to the axis, so as to hang as pendants.
 a. *Circular or elliptical section.*
 b. *Faceted section.*

Group XXIII.   *Notched and Gadrooned Beads and Pendants*

Subgroup A.   Beads.
 Family A. 1.   *Notched.*
The beads in this family can be divided into the following classes :
 a. *Milled.*   Fig. 21, A. 1. a.   Beads in which the perimeter has a series of small indentations round it, similar to the milled edge of a coin.
 b. *Crenelated.*   Fig. 21, A. 1. b.   Beads in which the perimeter has a series of larger notches, similar to the teeth of a cogwheel.
 c. *Rayed.*   Fig. 21, A. 1. c.   Beads in which there are a few large projections on the perimeter.
 d. *Radially grooved.*   Fig. 21, A. 1. d.   Beads in which the notches or grooves go from the perforation to the edge.   Beads of this class sometimes combine the features of one of the previous classes, in which case the two letters can be used to describe them.
 Family A. 2.   *Fluted beads.*

 a. *Spherical, oblate, and ellipsoidal.* c. *Cone.*
  Fig. 13.   d. *Bicone.*   Fig. 21, A. 2. d.
 b. *Cylindrical.*   e. *Disc.*   Fig. 21, A. 2. e.

 Family A. 3.   *Gadrooned beads.*
 a. *Spherical, oblate, and ellipsoidal.* (1) *Straight gadroons.* Fig. 11, a. (2) *Spiral gadroons.*   Fig. 11. b.   The beads in this class are the well-known melon beads. In the spiral ones the spirals are only slight.   When the spiral is great it is best to include them in group XVIII.

 b. *Cylindrical.*   d. *Bicone.*   Fig. 12.
 c. *Cone.*   e. *Disc.*   Fig. 21, A. 3. e.

Subgroup B.   Pendants.
    Family B. 2.   *Fluted pendants*.
    Family B. 3.   *Gadrooned pendants*.
       a. *Straight gadroons*.   Fig. 21, B. 3. a.   b. *Spiral gadroons*.   Fig. 21, B. 3. b.
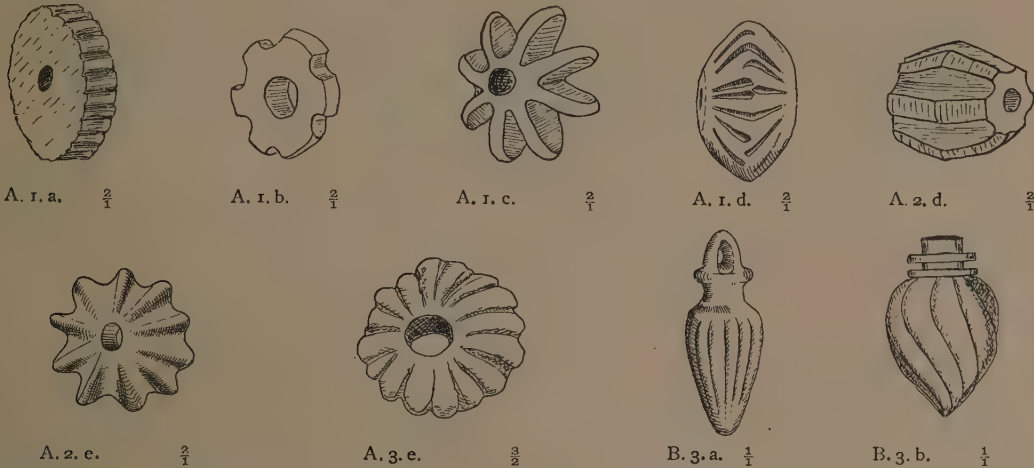
Fig. 21.   GROUP XXIII.   Notched and Gadrooned Beads and Pendants.

A. 1. a.   Milled bead.   Faience, Egypt, XXIIIrd Dynasty.
A. 1. b.   Crenelated bead.   Faience, Egypt, XXIIIrd Dynasty.
A. 1. c.   Rayed bead.   Faience, Tel el Amarna, XVIIIth Dynasty.
A. 1. d.   Radially grooved bead.   Faience, Egypt, XXIIIrd Dynasty.
A. 2. d.   Bicone fluted bead.   Agate, Ur, 2000 B. C.?
A. 2. e.   Disc fluted bead.   Faience, Egypt, XXIIIrd Dynasty.
A. 3. e.   Disc gadrooned bead.   Glass, Egypt, XIXth Dynasty.
B. 3. a.   Gadrooned pendant.   Faience, Egypt, XXIIIrd Dynasty.
B. 3. b.   Gadrooned pendant.   Amber, Italy, 800 B. C.

Group XXIV.   *Filigree and Lattice Beads and Pendants*
Subgroup A.   Beads.
    Family A. 1.   *Wire filigree beads*.
    The beads of this group are made of open wire-work, or the wire-work is the most important feature.
       a. *Open filigree*.   Fig. 22, A. 1. a.   b. *Solid filigree*.   Fig. 22, A. 1. b.
    In class a the wire-work is only supported by itself, whilst in class b there is a metal matrix to which the wire is attached.
    Family A. 2. *Skeleton beads*. Fig. 22, A. 2. These are hollow beads of faience with open-work patterns of thin thread, somewhat similar to the filigree wire beads.
Subgroup B.   Pendants.
    Family B. 1.   *Wire filigree pendants*.
    These pendants, made in open and solid filigree, are found in a large variety of forms.

Family B. 3.   *Lattice-work ivory scent-holders.*

These are elaborately carved ivory cases which open to enable a lump of scent to be inserted.   The carving of the lattice-work is sometimes extremely fine.   There are a great variety of forms.

A. 1. a. $\frac{2}{1}$ A. 1. b. $\frac{2}{1}$ A. 2. $\frac{3}{1}$

Fig. 22. GROUP XXIV. Filigree and Lattice Beads and Pendants.

A. 1. a. Open filigree bead.   Silver, Spain, 18th century.
A. 1. b. Solid filigree bead.   Silver, Japan, 19th century.
A. 2. Skeleton bead.   Faience, Egypt, XVIIIth Dynasty.

Group XXV.   *Granulated Beads and Pendants*

Subgroup A.   Beads.

These beads are either completely or partially made up of small balls or decorated in imitation of them.   They are generally made of metal, but sometimes of glass or faience.   There are the following families:

Family A. 1.   *Granulated metal beads.*

These beads are made by soldering together a large number of small metal balls, usually of gold or silver.   The spherical and odd-shaped ones are often called metal mulberry beads.   They are divided into the following classes:

   a. *Granulated metal cylinders.*
   b. *Granulated metal ball or mulberry beads.*
   c. *Granulated bicone and barrel beads.*   Fig. 23, A. 1. c.
   d. *Granulated disc beads.*   Fig. 23, A. 1. d.
   e. *Odd-shaped granulated beads.*   Fig. 23, A. 1. e.
   f. *Granulated metal spacing beads.*
   g. *Metal beads with granulated collars.*

Family A. 2.   *Imitation granulated metal beads.*   Fig. 23, A. 2.

These beads are made out of a sheet or tube of metal and are carved or stamped to imitate a granulated bead.   The usual method is to take a sheet of metal and file two series of grooves right across it, the one series being at right angles to the other, and then bend it into a cylinder.

Family A. 3.   *Moulded glass granulated beads.*

These beads are moulded with bosses all over them, and are often gilt to represent gold beads.

   a. *Moulded glass granulated cylinders.*   Fig. 23, A. 3. a.
   b. *Glass mulberry beads.*   Fig. 23, A. 3. b.

These are generally more or less globular and have bosses moulded all over them; they are therefore included here and not in the next group of beads representing fruit.

Family A. 4.   *Cut glass granulated beads.*   Fig. 23, A. 4.

These are made by taking a yellow glass cylinder and cutting on it a series of grooves parallel to the axis and turning a series of rings round it, so as to leave rows of spots standing up.
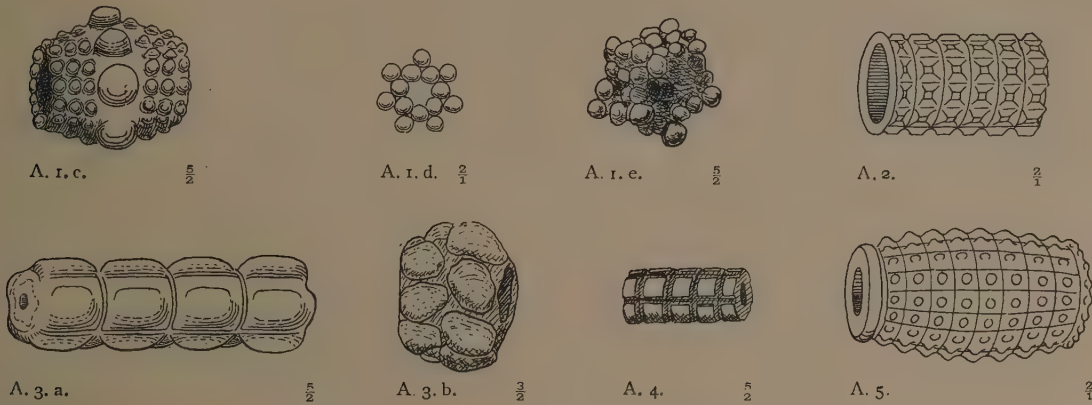
Fig. 23.   GROUP XXV. Granulated Beads and Pendants.

A. 1. c. Granulated barrel bead.   Silver, Egypt, 400 B.C.
A. 1. d. Granulated disc bead.   Gold, Greece, 700 B.C.
A. 1. e. Irregular granulated bead.   Silver, Palestine, Medieval.
A. 2. Imitation granulated bead.   Silver, Egypt, 400 B.C.
A. 3. a. Moulded granulated cylinder bead.   Glass, Cyprus, 500 B.C.
A. 3. b. Mulberry bead.   Glass, Egypt, Roman Period.
A. 4. Cut glass granulated bead.   Glass, Egypt, XIXth Dynasty.
A. 5. Faience granulated bead.   Faience, Egypt, XXIIIrd Dynasty.

Family A. 5.   *Faience granulated beads.*   Fig. 23, A. 5.

These are generally barrel-shaped.

Family A. 6.   *Cut stone granulated beads.*

These are cut in a similar method to the cut glass granulated beads in family A. 4.

Group XXVI.   *Beads and Pendants representing or made of Fruits, Flowers, Leaves, or Seeds*

As this group is divided into a large number of families and classes which are the same for both subgroup A and subgroup B, they are listed together, but all classes are not necessarily represented in both subgroups.

Many more classes will probably have to be added to this group later, but the more usual ones are given below.

E 2

Families A. 1 and B. 1.   *Beads and pendants made of or representing flowers.*

a. *Chrysanthemum.*

b. *Corncockle.* Centauria. Fig. 24, B. 1. b.

c. *Daisy.* Anthemis. Fig. 24. B. 1. c.

d. *Lily.* Fig. 24, B. 1. d.

e. *Lotus.* Fig. 24, A. 1. e, and B. 1. e.

f. *Papyrus.* Fig. 24, A. 1. f.

g. *Poppy.* Fig. 24, B. 1. g. These are generally represented by single petals.

h. *Rose.* A number of representations of flowers with five petals are included in this class. Beads are also made of petals of roses crushed up into a solid mass.

i. *Thistle.*

Families A. 2 and B. 2.   *Beads and pendants made of or representing fruits.*

a. *Date.* Fig. 24, B. 2. a.

b. *Gourd.* Fig. 24, B. 2. b.

c. *Grapes.* Fig. 24, B. 2. c.

d. *Mandrake.* Fig. 24, B. 2. d.

e. *Nightshade.* Necklaces of these have been found on an Egyptian mummy.

f. *Pineapple.*

g. *Pomegranate.* Fig. 24, B. 2. g.

Families A. 3. and B. 3. *Beads and pendants made of or representing nuts, seeds, or fruit-stones.*

a. *Acorn.*

b. *Cardamon seeds.*

c. *Date stones.*

d. *Lotus seed-vessel.* Fig. 24, B. 3. d.

e. *Melon seed.*

f. *Peach stone.*

g. *Poppy seed-vessel.* Fig. 24, A. 3. g.

h. *Quondong nuts.*

Families A. 4. and B. 4.   *Beads and pendants made of or representing leaves.*

a. *Acanthus.*

b. *Clover.*

c. *Olive.*

d. *Palm.* Fig. 24, B. 4. d.

e. *Willow.*

Families A. 5 and B. 5.   *Beads and pendants made of or representing straw, grass, etc.*

a. *Straw.* Fig. 24, A. 5. a.

Families A. 6 and B. 6.   *Beads and pendants representing conventional designs derived from flowers.*

a. *Rosettes.* Fig. 24, A. 6. a.

b. *Conventions derived from the lotus.* Fig. 24, B. 6. b.

Group XXVII.   *Beads and Pendants representing or made of Complete Shells.*
Subgroup A.   Beads.

The beads in this group are either made of complete shells, or are imita-

tions of complete shells made in some other material. The great quantity of beads mostly of regular forms cut out of shell is not included in this group.

A. 1. e. $\frac{2}{1}$

A. 1. f. $\frac{2}{1}$

A. 3. g. $\frac{1}{1}$

A. 5. a. $\frac{3}{1}$

A. 6. a. $\frac{3}{4}$

B. 1. b. $\frac{7}{8}$

B. 1. c. $\frac{7}{8}$

B. 1. d. $\frac{3}{4}$

B. 1. e. $\frac{2}{1}$

B. 1. g. $\frac{1}{1}$

B. 2. a. $\frac{2}{1}$

B. 2. b. $\frac{1}{1}$

B. 2. c. $\frac{3}{2}$

B. 2. d. $\frac{2}{1}$

B. 2. g. $\frac{2}{1}$

B. 3. d. $\frac{2}{1}$

B. 4. d. $\frac{3}{2}$

B. 6. b. $\frac{1}{1}$
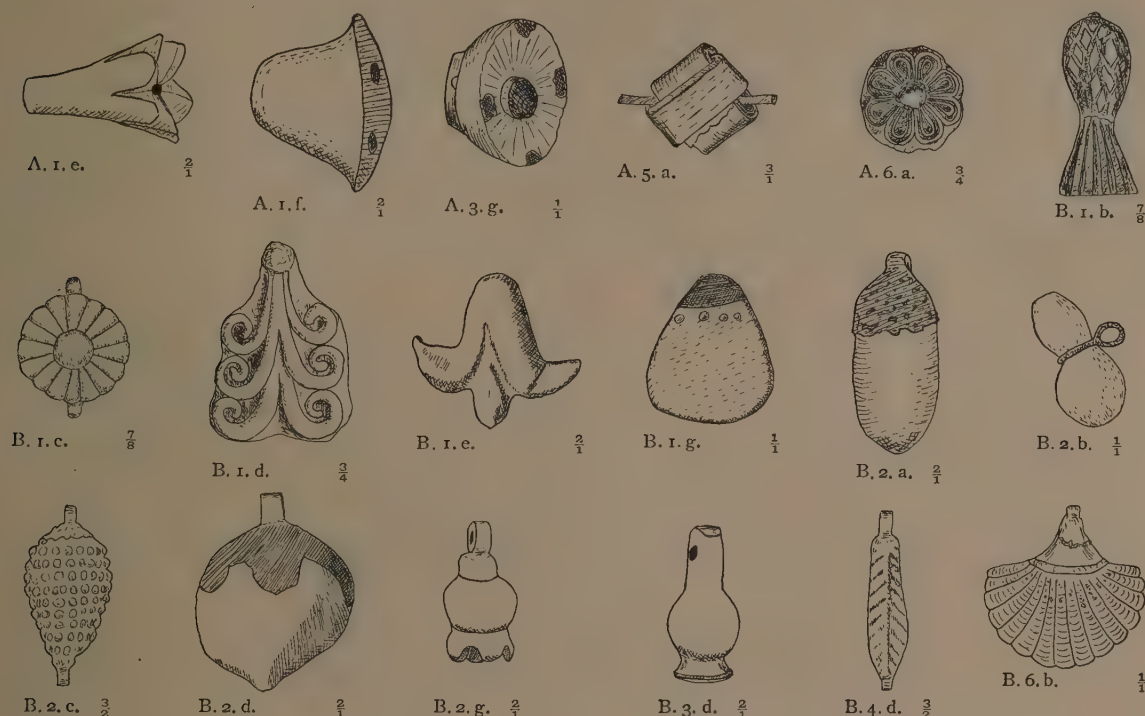
Fig. 24. GROUP XXVI. Beads and Pendants made of or representing Flowers, Fruits, Seeds, or Leaves.

A. 1. e. Lotus bead. Faience, Egypt, XVIIIth Dynasty.
A. 1. f. Papyrus bead. Faience, Egypt, XIIth Dynasty.
A. 3. g. Poppy seed-vessel (?) bead. Faience, Egypt, XXIIIrd Dynasty.
A. 5. a. Straw bead. Straw, Egypt, XVIIIth Dynasty.
A. 6. a. Rosette bead. Terra-cotta, Greece.
B. 1. b. Corncockle pendant. Faience, Tel el Amarna, XVIIIth Dynasty.
B. 1. c. Daisy pendant. Faience, Tel el Amarna, XVIIIth Dynasty.
B. 1. d. Lily pendant. Glass, Mycenae, 1300 B. C.
B. 1. e. Lotus pendant. Faience, Egypt, XIIth Dynasty.
B. 1. g. Poppy petal pendant. Faience, Tel el Amarna, XVIIIth Dynasty.
B. 2. a. Date pendant. Faience, Tel el Amarna, XVIIIth Dynasty.
B. 2. b. Gourd pendant. Silver, Japan, 19th century.
B. 2. c. Grape pendant. Faience, Tel el Amarna, XVIIIth Dynasty.
B. 2. d. Mandrake pendant. Faience, Tel el Amarna, XVIIIth Dynasty.
B. 2. g. Pomegranate pendant. Faience, Tel el Amarna, XVIIIth Dynasty.
B. 3. d. Lotus seed-vessel pendant. Carnelian, Egypt, XVIIth Dynasty.
B. 4. d. Palm leaf pendant. Faience, Tel el Amarna, XVIIIth Dynasty.
B. 6. b. Conventional lotus pendant. Faience, Tel el Amarna, XVIIIth Dynasty.

Family A. 1. *Beads consisting of complete shells.* Fig. 25, A. 1.

Many varieties of shell have been used to make beads by simply piercing and then stringing them. A few of these varieties are referred to later under materials.

Family A. 2. *Beads consisting of carved representations of complete shells.* Fig. 25, A. 2.

These beads are copies of shells, carved in stone, glass, frit, and other materials. Fig. 25, A. 2 is carved in carnelian.

Family A. 3. *Beads consisting of moulded representations of complete shells.*

These are moulded out of glass and faience.

Family A. 5. *Beads consisting of complete Echinus shells.* Fig. 25, A. 4.

In spite of their fragile nature these have been used for beads ; in fact some of the earliest known beads are made of these. The specimen figured is Late Aurignacian.
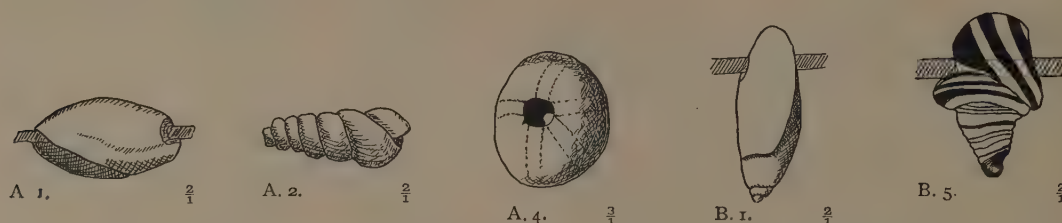
Fig. 25. Group XXVII. Beads and Pendants made of or representing Complete Shells.

A. 1. Shell bead. Egypt, XIIth Dynasty.
A. 2. Imitation shell bead. Carnelian, Egypt, XIIth Dynasty.
A. 4. Echinus shell bead. France, Aurignacian Period.
B. 1. Shell pendant. Egypt, XIIth Dynasty.
B. 5. Imitation shell pendant. Glass, Egypt, XVIIIth Dynasty (?).

Subgroup B. Pendants.

Family B. 1. *Pendants consisting of complete shells.* Fig. 25, B. 1.

Many varieties of shells are used for this purpose.

Family B. 2. *Pendants consisting of carved representations of complete shells.*

Family B. 3. *Pendants consisting of moulded representations of complete shells.*

Family B. 5. *Pendants consisting of imitations of complete shells made out of twisted glass.* Fig. 25, B. 5.

These imitation shells are made out of twisted threads of glass. The one figured is made of black and yellow threads.

Group XXVIII. *Beads and Pendants representing Weapons or Tools*

As weapons and tools are so closely allied they are both included in this group.

Subgroup A. Beads.

Family A. 1. *Axe beads.*

a. *Double-axe beads.* Fig. 26, A. 1. a.

Subgroup B.   Pendants.

  Family B. 1.   *Axe pendants.*
    a. *Double-axe pendants.*
    b. *Models of stone axes in stone, wood, etc.*   Fig. 26, B. 1. b.
  Family B. 2.   *Adze pendants.*   Fig. 26, B. 2.
  Family B. 3.   *Arrow-head pendants.*

There are many varieties of this form of pendant, some of which are still worn as charms.   A simple form is shown in Fig. 26, B. 3.
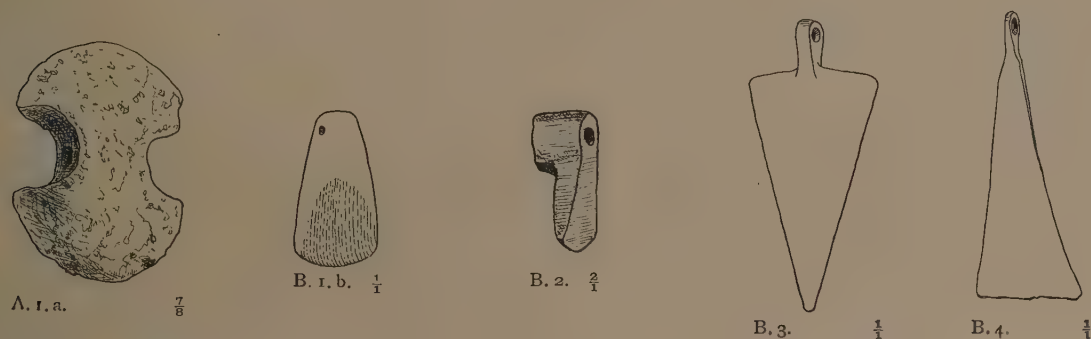
Fig. 26.   GROUP XXVIII.   Beads and Pendants representing Weapons or Tools

A. 1. a. Double-axe bead.   Amber, Denmark, Neolithic.
B. 1. b. Axe pendant.   Carnelian, Egypt, Old Kingdom.
B. 2. Adze pendant.   Faience, Mesopotamia, 2000 B.C.
B. 3. Arrow-head pendant.   Bronze, Italy, 900 B.C.
B. 4. Razor (?) pendant.   Bronze, Italy, 900 B.C.

Family B. 4.   *Razors and knives.*   Fig. 26, B. 4.
Family B. 5.   *Lance-heads.*
Family B. 6.   *Shields.*
Family B. 7.   *Chisels.*

Group XXIX.   *Beads and Pendants representing Emblems*

This group contains all the beads representing emblems, which are not included in other groups.   Those representing flowers, shells, or weapons have already been referred to in previous groups, and those representing human beings, animals, and deities are included in later groups.

The emblems of this group are very numerous, but the following families contain those most usually found:

Subgroup A.   Beads.

  Family A. 1.   *Cross.*   Fig. 27, A. 1.   Family A. 3.   *Moon and crescent.*
  Family A. 2.   *Sun.*   Fig. 27, A. 3.

Family A. 4. *Papyrus sceptre.* Fig. 27, A. 4.

Family A. 5. *Knot.* Fig. 27, A. 5.

Family A. 6. *Cartouche and name beads.*

    a. *Cartouche beads.* Fig. 27, A. 6. These are beads in the shape of a cartouche.

    b. *Name beads.* Fig. 27, A. 6. b.

Family A. 7. *Wallet beads.* Fig. 27, A. 7.

Family A. 15. *Jug and vase beads.* Fig. 27, A. 15.

Family A. 19. *Star beads.* Fig. 27, A. 19.

Subgroup B.   Pendants.

Family B. 1. *Cross.* Fig. 27, B. 1.

Family B. 2. *Sun.* Fig. 27, B. 2.

Family B. 3. *Moon and crescent.* Fig. 27, B. 3.

Family B. 4. *Papyrus sceptre.*
    a. *Single.* Fig. 27, B. 4. a.
    b. *Double.* Fig. 27, B. 4. b.

Family B. 5. *Knot.*

Family B. 8. *Ankh.* Fig. 27, B. 8.

Family B. 9. *Crown.*
    a. *Crown of Upper Egypt.* Fig. 27, B. 9. a.
    b. *Crown of Lower Egypt.* Fig. 27, B. 9. b.

Family B. 10. *Tet* or *Zad.* Fig. 27, B. 10.

Family B. 11. *Uraeus.* Fig. 27, B. 11.

Family B. 12. *Girdle.* Fig. 27, B. 12.

Family B. 13. *Charm case, and pectoral.* Fig. 27, B. 13.

Family B. 14. *Bell.* Fig. 27, B. 14.

Family B. 15. *Jugs and vases.* Fig. 27, B. 15.

Family B. 16. *Steps.*

Family B. 17. *Altar.*

Family B. 18. *Key.*

All the above families contain many varieties, which can be divided into classes. This has not been attempted and classes have only been specified when more than one specimen from a family has been illustrated.

Group XXX.   *Beads and Pendants representing Human Beings, or Human-headed Deities*

A few beads and a great number of pendants belong to this group. Pendants representing men or women are found in most countries. In many cases these represent deities. In Greece and Rome pendants of Jupiter, Eros, and other gods are found, but the greatest number from any single country comes from Egypt, where amongst others the following deities are found, Amen, Anhur, Bes, Hathor, Hatmeyt, Horus, Isis, Khonsu, Maat, Min, Mut, Nebhat, Nefertum, Neit, Osiris, Ptah-Seker, Ra, Set, and Shu.
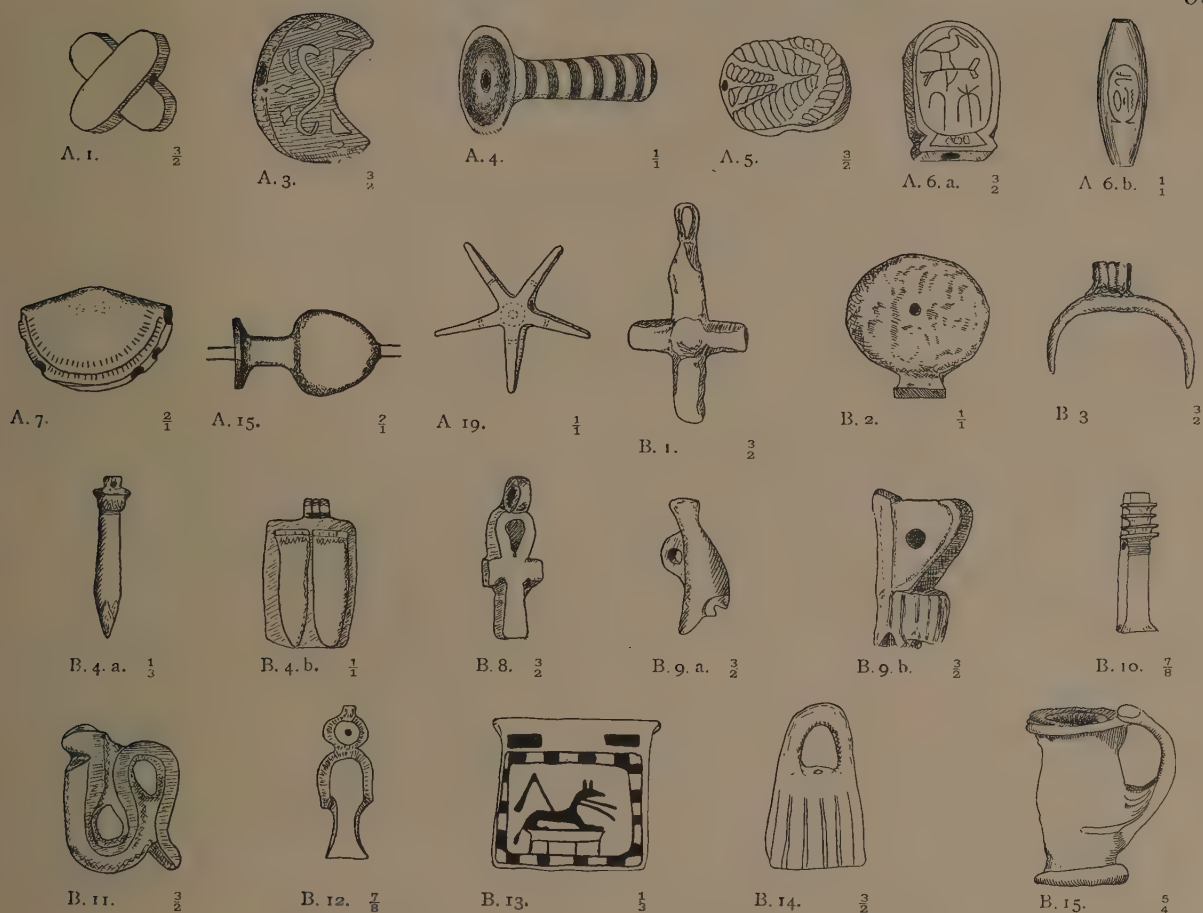
Fig. 27. GROUP XXIX. Beads and Pendants representing Emblems.

A. 1. Cross bead.   Stone, Crete.
A. 3. Crescent bead.   Bronze, Syria, Arab Period.
A. 4. Papyrus sceptre bead.   Glass, Egypt, XVIIIth Dynasty.
A. 5. Knot bead.   Gold, Egypt, XIIth Dynasty.
A. 6. a. Cartouche bead.   Lapis, Egypt, XVIIth Dynasty.
A. 6. b. Name bead.   Amethyst, Egypt, XIIth Dynasty.
A. 7. Wallet bead.   Gold, Egypt, XVIIth Dynasty.
A. 15. Vase bead.   Gold, Egypt, XIIth Dynasty.
A. 19. Star bead.   Faience, Egypt, XIIth Dynasty.
B. 1. Cross pendant.   Bronze, Coptic.
B. 2. Sun pendant.   Black stone, Egypt, XXVIth Dynasty.
B. 3. Crescent pendant.   Gold, Egypt, XVIIIth Dynasty.
B. 4. a. Papyrus sceptre pendant.   Faience, Egypt, XXVIth Dynasty.
B. 4. b. Double papyrus sceptre pendant.   Jade (?), Egypt, XXVIth Dynasty.
B. 8. Ankh pendant.   Faience, Egypt, XVIIth Dynasty.
B. 9. a. Crown of Upper Egypt, pendant.   Faience, Egypt, XXVIth Dynasty.
B. 9. b. Crown of Lower Egypt, pendant.   Faience, Egypt, XXVIth Dynasty.
B. 10. Tet pendant.   Faience, Egypt, XXIIIrd Dynasty.
B. 11. Uraeus pendant.   Carnelian, Egypt, XVIIIth Dynasty.
B. 12. Girdle pendant.   Stone, Egypt, XXVIth Dynasty.
B. 13. Pectoral.   Faience, Egypt, XVIIth Dynasty.
B. 14. Bell pendant.   Bronze, Egypt.
B. 15. Jug pendant.   Glass, Syria, Roman Period.

Group XXXI. *Beads and Pendants representing Parts of Human Beings.*

Subgroup A. Beads.

Family A. 1. *Head and face beads.*

a. *Complete heads.*

b. *Face only.* One variety of these inlaid in glass mosaic is illustrated. Fig. 28, A. 1. b.

c. *Head with two faces.* Fig. 28, A. 1. c.

d. *Skull beads.*

Family A. 2. *Heart beads.* Fig. 28, A. 2. a.

Family A. 3. *Beads representing eyes.*

The large numbers of beads with circular spots or eyes, although in some cases they suggest an eye, are more often used as a protection against the evil eye; they are so important that they have been allotted a special group, no. XLVI. They are also referred to in Part VI, on decoration.

The following classes are, however, included in this group:

a. *Beads in the form of single uchats.* Fig. 28, A. 3. a. These are representations of the eye of Horus and are one of the commonest forms of Egyptian amulets.

b. *Beads in the form of multiple uchats.* Fig. 28, A. 3. b.

c. *Faience beads with uchats painted or inscribed upon them.* Fig. 28, A. 3. c.

These are beads of regular form, frequently spherical, which have uchats painted or inscribed upon them.

Family A. 7. *Breast beads.*

a. *Hand holding breast.* Fig. 28, A. 7. a.

Subgroup B. Pendants.

Family B. 1. *Head and face pendants.*

a. *Complete heads.*   c. *Head with two faces.*

b. *Face only.* Fig. 28, B. 1. b.   d. *Skull pendants.*

Family B. 2. *Heart pendants.*

a. *Ab pendants.* Fig. 28, B. 2. a. These are the Egyptian form of heart amulet.

b. *Heart-shape pendants.* Fig. 28, B. 2. b.

Family B. 3. *Eye pendants.*

a. *Uchats.*

Family B. 4. *Leg pendants.* Fig. 28, B. 4.

Family B. 5. *Arm or hand pendants.* Fig. 28, B. 5.

Family B. 6. *Ear pendants.*

Family B. 7. *Breast pendants.*

Family B. 8. *Phallus pendants.*

Family B. 9. *Human tooth pendants.*

Human teeth are used as pendants, sometimes over a hundred being strung on one necklace.

  a. *Unperforated, with notches ground for suspension.*   Fig. 28, B. 9. a.
  b. *Perforated.*   Fig. 28, B. 9. b.

| A. 1. b. | $\frac{3}{2}$ | A. 1. c. | $\frac{5}{4}$ | A. 2. a. | $\frac{5}{4}$ | A 3. a. | $\frac{2}{3}$ | A. 3. b. | $\frac{5}{4}$ |

| A. 3. c. | $\frac{5}{4}$ | A. 7. a. | $\frac{2}{1}$ | B. 1. b. | $\frac{1}{2}$ | B. 2. a. | $\frac{3}{2}$ | B. 2. b. | $\frac{1}{1}$ |

B. 4. $\frac{5}{4}$ B. 5. $\frac{5}{4}$ B. 9. a. $\frac{1}{1}$ B. 9. b. $\frac{3}{2}$
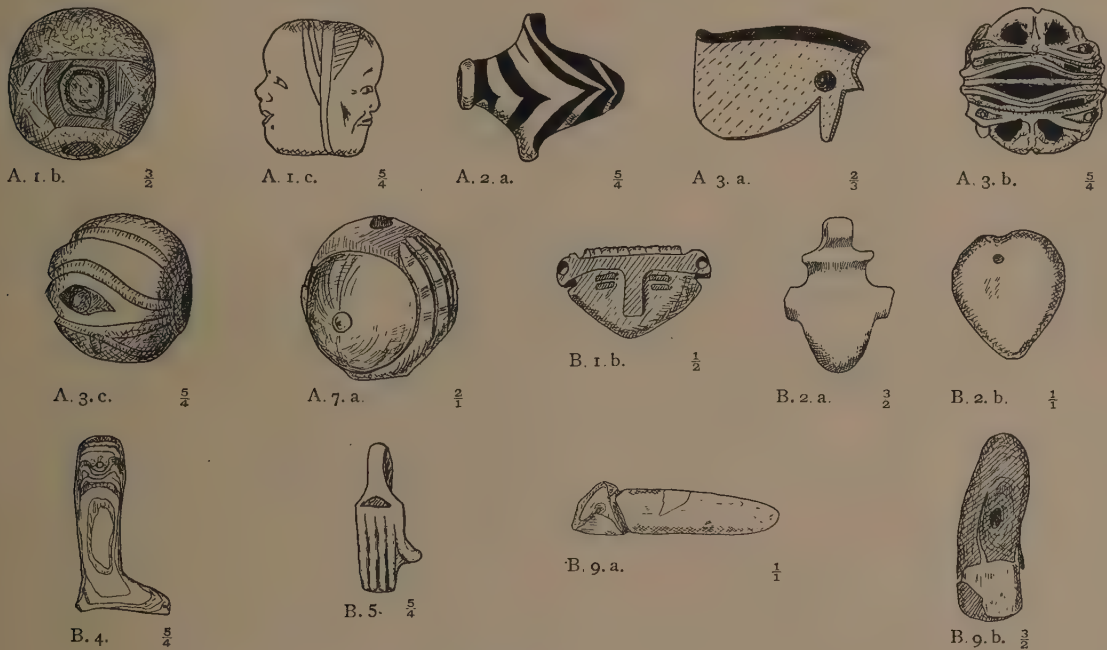
Fig. 28. Group XXXI. Beads and Pendants representing Parts of Human Beings.

A. 1. b. Face bead. Glass, Palmyra, 200 B. C.
A. 1. c. Face bead. Wax, Japan, 19th century.
A. 2. a. Ab heart bead. Glass, Egypt, XVIIIth Dynasty.
A. 3. a. Uchat. Faience, Egypt, XXIIIrd Dynasty.
A. 3. b. Multiple uchat. Faience, Egypt, XXIIrd Dynasty.
A. 3. c. Uchat bead. Faience, Egypt, XXIInd Dynasty.
A. 7. a. Breast bead. Carnelian, Aegina, 1100 B. C.
B. 1. b. Face pendant. Stone, Lake Guatavita, Columbia.
B. 2. a. Ab pendant. Green feldspar, Egypt, XVIIIth Dynasty.
B. 2. b. Heart pendant. Carnelian, Salonica.
B. 4. Leg pendant. Carnelian, Egypt, VIth Dynasty.
B. 5. Hand pendant. Carnelian, Egypt, VIIth Dynasty.
B. 9. a. Tooth pendant. Algeria, Neolithic Period.
B. 9. b. Tooth pendant. France, Aurignacian Period.

Group XXXII.   *Beads and Pendants representing Animals*
or Animal-headed Deities

Subgroup A. Beads.

Beads of this group are not nearly so common as pendants, but they are sometimes met with.

Subgroup B.   Pendants.

Many animals are represented as pendants, the more usual are contained in the following families:

Family B. 1.   *Antelope.*

Family B 2. *Ape and monkey.* Fig. 29, B. 2.

Family B. 3.   *Horse.*

Family B. 4.   *Bear.*   Fig. 29, B. 4.

Family B 5.   *Bull.*

Family B 6.   *Camel.*

Family B 7.   *Cat.*

Family B 8.   *Cow.*

Family B. 9.   *Dog.*

Family B. 10.   *Elephant.* Fig. 29, B. 10.

Family B. 11.   *Gazelle.*
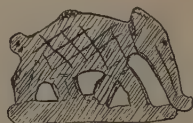
B. 2. $\frac{5}{4}$ B. 4. $\frac{3}{4}$ B. 10. $\frac{3}{2}$ B. 18 $\frac{1}{3}$ B. 20. $\frac{1}{3}$

Fig. 29.   GROUP XXXII.   Beads and Pendants representing Animals or Animal-headed Deities.

B. 2. Ape pendant.   Faience, Egypt, XXVIth Dynasty.
B. 4. Bear pendant.   Amber, Aquilea, 800 B. C.
B. 10. Elephant pendant.   Silver, Egypt, Ptolemaic.
B. 18. Lion pendant.   Faience, Egypt, XXVIth Dynasty.
B. 20. Pig pendant.   Faience, Egypt, XXXth Dynasty.

Family B. 12.   *Hare.*

Family B. 13.   *Hedgehog.*

Family B. 14.   *Hippopotamus.*

Family B. 15.   *Ibex.*

Family B. 16.   *Jackal.*

Family B. 17.   *Leopard.*

Family B. 18.   *Lion.*   Fig. 29, B. 18.

Family B. 19.   *Mouse.*

Family B. 20.   *Pig.*   Fig. 29, B. 20.

Family B. 21.   *Ram.*

Family B. 22.   *Sheep.*

Family B. 23.   *Shrew.*

Family B. 24.   *Stag and deer.*

The deities with animal heads are included in the same family as the animals whose head they have, but they are put in a separate class.   Thus, Thoueris would be in family B. 14, Sekhmet in B. 18, Bastet in B. 7, Anubis in B. 16, etc.

Group XXXIII.   *Beads and Pendants representing Birds or Bird-headed Deities*

Subgroup A.   Beads.

Although there are many bird beads they are not so common as pendants, so the classes are enumerated under subgroup B.   An example of a duck bead is shown.   Fig. 30, A. 1.

Some of the beads of this group are double, the best known is the double dove bead.   Fig. 30, A. 2.

Subgroup B.   Pendants.

The more usual bird pendants are included in the following families:

Family B. 1.	*Duck.*	Family B. 6.	*Ostrich.*
Family B. 2.	*Dove and pigeon.*	Family B. 7.	*Quail.*
Family B. 3.	*Eagle.*	Family B. 8.	*Vulture.*
Family B. 4.	*Ibis.*	Family B. 9.	*Wagtail.*
Family B. 5.	*Hawk.* Fig. 30, B. 5.		

A. 1. $\frac{2}{1}$

A. 2. $\frac{1}{1}$

B. 5. $\frac{5}{4}$

Fig. 30.   GROUP XXXIII. Beads and Pendants representing Birds and Bird-headed Deities.
A. 1. Duck bead.   Faience, Syria, Roman Period.
A. 2. Double dove bead.   Glass, Tel el Amarna, XVIIIth Dynasty.
B. 5. Hawk pendant.   Lapis, Egypt, XVIIIth Dynasty.

Bird-headed deities are included in the same family as the birds whose head they have.   For instance, Thoth would be included in B. 4, and Horus, when represented with the hawk head, in B. 5.

Group XXXIV.   *Beads and Pendants representing Reptiles, Insects, etc.,
or Deities with the Heads of Reptiles, Insects, etc.*

Subgroup A.   Beads.

The most common form of bead which might have been included in this group is the Scarab. As these, however, have such a very definite and special interest, they are put into a group of their own.

With the above exception, the pendants in this group also are much more numerous than the beads, but various beads are found. As examples, a frog bead (A. 3) and a fish bead (A. 7) are shown in fig. 31.

Subgroup B.   Pendants.

Most of the reptiles, etc., most usually met with are in the following families:

Family B. 1.	*Crocodile.*	Family B. 6.	*Serpent.* Fig. 31, B. 6.
Family B. 2.	*Lizard.*	Family B. 7.	*Fish.*
Family B. 3.	*Frog.*	Family B. 8.	*Scorpion.*
Family B. 4.	*Toad.*	Family B. 9.	*Beetle.*
Family B. 5.	*Turtle.* Fig. 31, B. 5.	Family B. 10.	*Hornet.*

Family B. 11. *Locust.* Fig. 31, B. 11. Family B. 14. *Chrysalis.*
Family B. 12. *Fly.* Fig. 31, B. 12.   Family B. 15. *Bee.*
Family B. 13. *Butterfly.*

Deities with heads representing reptiles, etc., are included in the same families as the reptiles, etc., are themselves; for instance, the crocodile god would be included in family B. 1, and the snake god in B. 6.
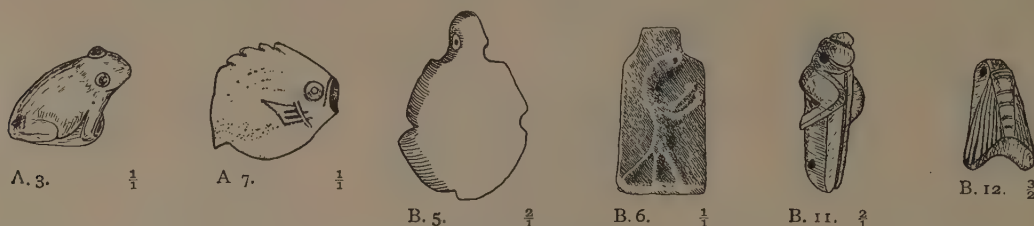
Fig. 31. GROUP XXXIV. Beads and Pendants representing Reptiles, Insects, etc., or Deities with the Heads of Reptiles, Insects, etc.

A. 3. Frog bead. Stone, Meroe, XXVth Dynasty.
A. 7. Fish bead. Ivory, Japan, 19th century.
B. 5. Turtle pendant. Stone, Egypt, Predynastic.
B. 6. Snake-god pendant. Faience, Egypt, XIIth Dynasty.
B. 11. Locust pendant. Carnelian, Egypt, XIIth Dynasty.
B. 12. Fly pendant. Faience, Egypt, XIIth Dynasty.

Group XXXV. *Beads and Pendants representing or made of Parts of Animals, Birds, Reptiles, Insects, etc.*

Subgroup A. Beads.

Beads are sometimes made as representations of heads and other parts of animals, but they are uncommon compared to the pendants.

Subgroup B. Pendants.

Family B. 1. *Heads of animals, etc.* A few of the more common are in the following classes :

a. *Bull's head.* Fig. 32, B. 1. a.
b. *Hippopotamus' head.* Fig. 32, B. 1. b.
c. *Cat's head.* Fig. 32, B. 1. c.
d. *Lion's head.*

e. *Jackal's head.*
f. *Leopard's head.*
g. *Ram's head.* Fig. 32, B. 1. g.
h. *Snake's head.*

Family B. 2. *Teeth.* Fig. 32, B. 2.

Many varieties of real teeth have been used as pendants, from the earliest period to the present day. The one shown is a spacing bead made from the incisor of a chamois, and is of the Aurignacian period.

Family B. 3. *Claws.*

Real claws and imitations of them in stone have been used as pendants.

Family B. 4.   *Beaks.*   Fig. 32, B. 4.

The beaks of parrots, toucans, and other birds have been used as pendants.

Family B. 5.   *Bones.*

Many small bones, such as fish vertebrae, knuckle bones (both real and imitation), and leg bones of small animals and birds have been used as beads

B. 1. a. $\frac{5}{4}$ B. 1. b. $\frac{4}{1}$ B. 1. c. $\frac{3}{2}$ B. 1. g. $\frac{2}{1}$ B. 2. $\frac{3}{2}$ B. 4. $\frac{1}{4}$
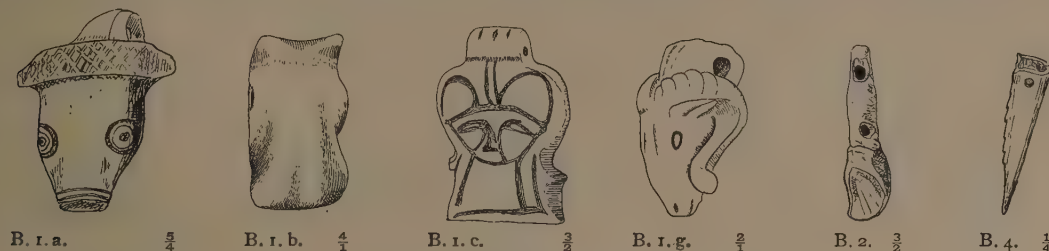
Fig. 32. GROUP XXXV. Beads and Pendants made of or representing Parts of Animals, Birds, Reptiles, Insects, etc.

B. 1. a. Bull's head pendant. Stone, Crete.
B. 1. b. Hippopotamus head pendant. Steatite, Egypt, XIIth Dynasty.
B. 1. c. Cat head pendant. Glazed steatite, Egypt, XVIIIth Dynasty.
B. 1. g. Ram's head pendant. Faience, Egypt, XXVIth Dynasty.
B. 2. Chamois tooth spacing bead. France, Aurignacian Period.
B. 4. Toucan beak pendant.

or pendants.   Even the carapace of the tortoise, when divided into its original plaques, and bones as large as the foot bones of reindeer have been found as pendants.

Family B. 6.   *Legs of animals.*

These are frequently moulded in faience.

Family B. 7.   *Horns of animals.*

Group XXXVI.   *Scarabs and Scaraboids.*
Group XXXVII.   *Cylinder Seals.*
Group XXXVIII.   *Ball Seals.*
Group XXXIX.   *Cone Seals.*
Group XL.   *Lenticular Seals.*
Group XLI.   *Button Seals.*

Group XLII.   *Button Beads and Toggle Beads*

Subgroup A.   Beads.

Family A. 1.   *Unperforated button beads.*

These possibly should not be considered as beads, as they are not perforated, but they have been found as parts of necklaces.

a. *Disc button beads.*   Fig. 33, A. 1. a.   These discs are found in great numbers, and probably the great majority were not used as beads.   Nevertheless, some have been found made into a sort of bead, by cementing two together

with a string through the cement, and there is no other explanation as to their use. It is suggested that they were game pieces, but they do not seem to have been found with game boards, as have some other variety of game pieces. Some of them are very elaborately ornamented.

b. *Dumb-bell.* These are frequently similar to the beads shown in fig. 33, A. 5. b, but they are not perforated. A special form made in amber is like an ordinary ellipsoid bead, which is not perforated, but has a groove round for suspension. Fig. 33, A. 1. b.
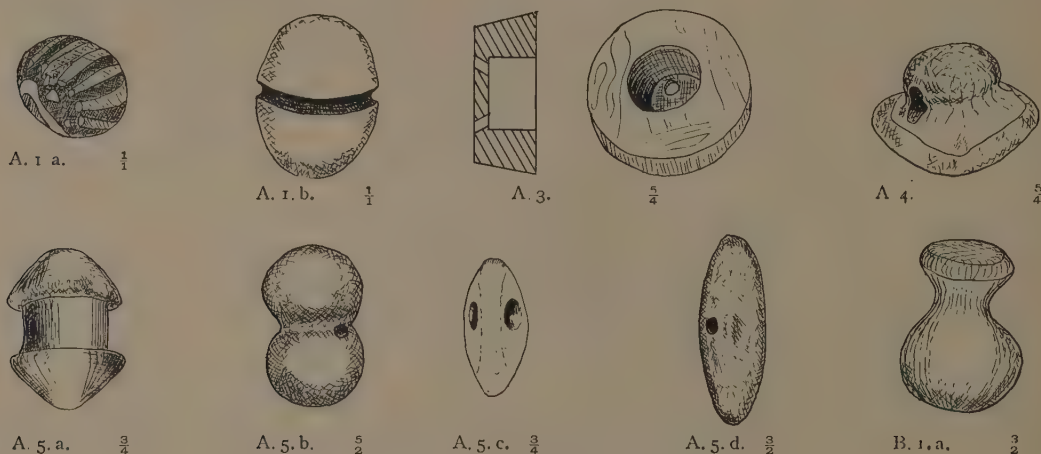
Fig. 33. Group XLII. Button Beads and Toggle Beads.

A. 1. a. Disc button bead. Glass, Egypt, Roman Period.
A. 1. b. Dumb-bell bead. Amber, Italy, 700 B. C.
A. 3. Button bead with depressed centre. Red agate, Lake Guatavita, Columbia.
A. 4. Button bead. Stone, Syria.
A. 5. a. Toggle bead. Amber, Denmark, Neolithic.
A. 5. b. Toggle bead. Glass, Egypt, XVIIIth Dynasty.
A. 5. c. Toggle bead. Carnelian, Egypt, Predynastic.
A. 5. d. Toggle bead. Faience, Egypt, VIIIth Dynasty.
B. 1. a. Button pendant. Glass, Egypt, Roman Period.

Family A. 2. *Button beads with V perforation and flat bases.*
a. *With circular base.* Fig. 6.
b. *With oval base.*

Family A. 3. *Button beads with depressed centre.* Fig. 33, A. 3.

These beads are carved out of a hard stone, they have a depressed centre in which are two perforations.

Family A. 4. *Button beads perforated through the projection.* Fig. 33, A. 4.

These are similar to button seals, but are not engraved.

Family A. 5. *Toggle beads.*

a. *Amber.* Fig. 33, A. 5. a.   c. *Stone.* Fig. 33, A. 5. c.
b. *Glass.* Fig. 33, A. 5. b.   d. *Faience.* Fig. 33, A. 5. d.

Subgroup B. Pendants.

Family B. 1. *Unperforated button pendants.*

a. *Globular.* Fig. 33, B. 1. a. These pendants have been found tied on to a string so as to form a necklace.

Group XLIII. *Elaborate Medieval Carved Beads*

These are usually called beads though they are really pendants. They were carved to go on a rosary. They were made out of hard wood such as pear or box, and occasionally out of nuts. The beads were sometimes two or three inches across, and were completely covered on the surface by carvings of figures, generally representing religious scenes. They frequently open into a triptych, where another scene is portrayed.

These beads were made in various European countries during the middle ages, and are the most elaborate form of bead known.

Group XLIV. *Elaborate Jewelled Pendants of the Middle Ages and Renaissance*

These pendants represent one of the high-water marks of jewellers' work. Some were pendants for the chains of the various orders of chivalry; others were worn as pendants by the wealthy patrons of art during the Renaissance. Frequently such pendants were designed so as to introduce some large and irregular shaped pearl or other jewel.

It is impossible in a paper of this sort to attempt to classify these pendants. They all have their own individuality. Many countries assisted in their production. Italy, Spain, England, France, Germany, and the Netherlands made pendants which in each case were influenced by their own artists of the period. The only other pendants that can be compared with them as regards general technique and design are some of the finest Egyptian pectorals.

Group XLV. *Netsukès*

These elaborate Japanese carvings are really pendants or toggles, and were put on the end of the string, by which the ' Inro ' or medicine case was carried. They are as a class rather different from other pendants, and are therefore put in a group by themselves, although many of them represent persons, animals, flowers, etc., and on that account might have been included in the previous groups.

Group XLVI. *Spot Beads and Eye Beads and Pendants with Circular Eyes*

The beads in this group are more fully dealt with in Part VI on Decoration, where the methods of manufacture are referred to (pp. 60–5). As far as their

form goes most of them have already been included among the regular beads in divisions I and II. Their decoration, however, is so much more important than their shape, many of them having been used as amulets, that they have been allotted this group.

Beads with plain spots, crumb beads, and beads with combined wave and spot decoration, have been included, as it is difficult to draw the line between some of them and spot eye beads.

Subgroup A.   Beads.

Family A. I.   *Spot stone eye beads.*
  a. *Cameo eye beads.*
    (1) *Carved from single stone.*
      (a) Single eye.   Fig. 34 a, A. 1. a.
      (b) Double eye.   Fig. 37.
      (c) Multiple spots.
These are cut from a stone with small natural inclusions giving the bead the appearance of a drilled spot stone bead which has had the spots filled.
    (2) *Cemented cameo eye beads.*
These are made by cementing two different coloured stones together.
  b. *Drilled spot stone eye beads.*
These are sometimes plain (fig. 38), at other times combined with carved lines (fig. 34 a, A. 1. b.). The spots are sometimes filled with enamel.
Family A. 2.   *Simple spot glass eye beads.*
  a. *Glass beads with raised definite spots.*
    (1) Spots only.   Fig. 34 a, A. 2. a, and Fig. 56.
    (2) Spots combined with waves.
    (3) Spots combined with other decoration.
  b. *Glass beads with flush definite spots.*
    (1) Spots only.   Fig. 34 a, A. 2. b, and Fig. 57.
    (2) Spots combined with waves.   Fig. 78.
    (3) Spots combined with other decoration.
The beads in the above two classes have the spots arranged in a definite order, whilst those in the two following classes are quite irregular.
  c. *Glass crumb beads with raised crumbs.*   Fig. 55.
  d. *Glass crumb beads with flush crumbs.*   Fig. 34 a, A. 2. d.
Family A. 3.   *Simple spot faience, frit, and pottery eye beads.*
  a. *Faience crumb beads.*   Fig. 34 a, A. 3. a.
  b. *Pricked faience and pottery eye beads.*   Fig. 34 a, A. 3. b.   In some cases beads have definite and elaborate patterns pricked on them, in which case it is better to classify them according to the pattern, and not include them here.
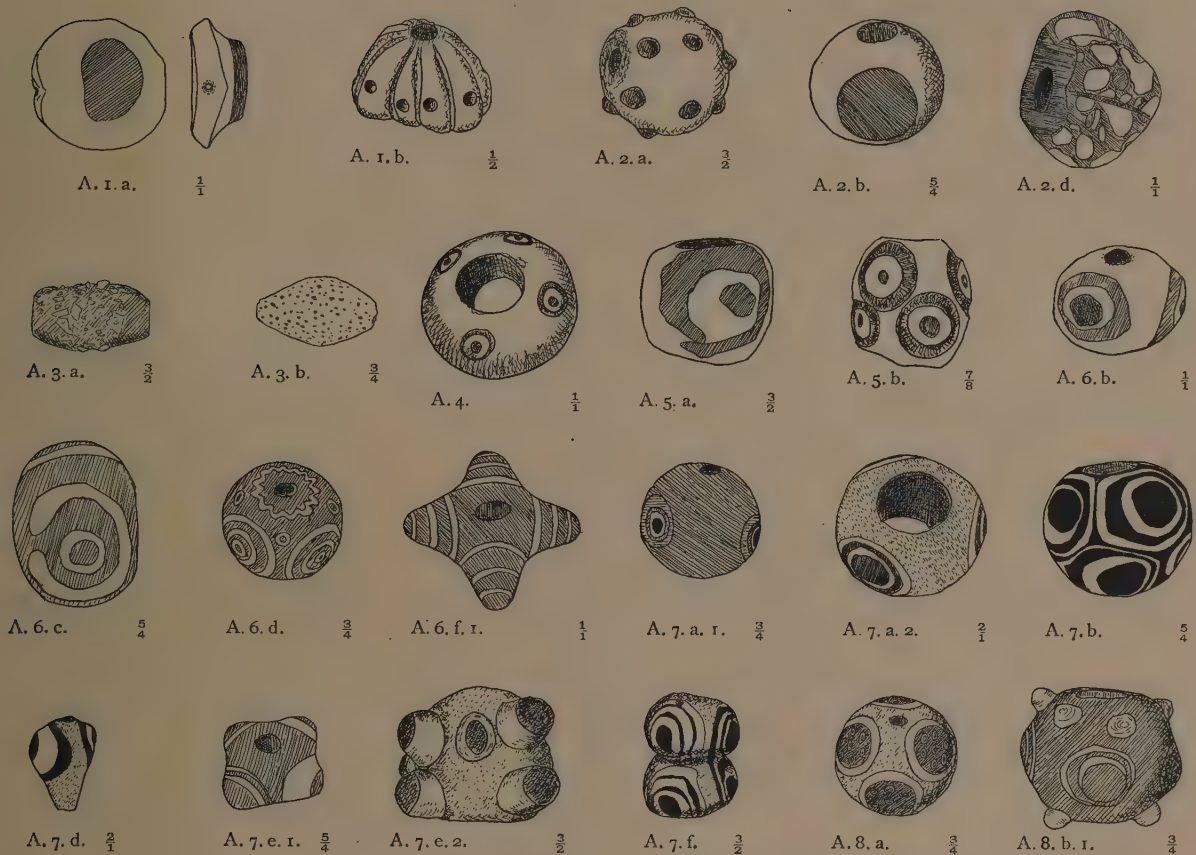
Fig. 34 a. GROUP XLVI. Spot Beads and Eye Beads and Pendants with Circular Eyes.

A. 1. a. Cat's eye bead. Onyx, Mesopotamia, 700 B. C.
A. 1. b. Drilled spot bead. Stone, Ireland, Celtic Period.
A. 2. a. Glass raised spot eye bead. Glass, Venice, 18th century.
A. 2. b. Glass flush spot eye bead. Glass, Japan, 18th century.
A. 2. d. Glass crumb bead. Glass, Cumae, 300 B. C.
A. 3. a. Faience crumb bead. Faience, Egypt, VIIth Dynasty.
A. 3. b. Pricked bead. Pottery, Egypt, Predynastic.
A. 4. Ring and dot stone eye bead. Stone, Egypt, XXIIIrd Dynasty.
A. 5. a. Ring and dot painted faience eye bead. Egypt, XXIIIrd Dynasty.
A. 5. b. Ring and dot incised faience eye bead. Persia.
A. 6. b. Impressed ring and central spot eye bead. Glass, Italy, Villanovan.
A. 6. c. Impressed concentric ring eye bead. Glass, Italy, Villanovan.
A. 6. d. Bead with impressed eyes and waves. Glass, Italy, Villanovan.
A. 6. f. 1. Horned impressed eye bead. Glass, Italy, Villanovan.
A. 7. a. 1. Stratified flush eye bead. Glass, Cumae, 500 B. C.
A. 7. a. 2. Stratified flush eye bead. Glass, Mediterranean Area, 600 B. C.
A. 7. b. Stratified flush eye bead. Glass, Italy, 700 B. C.
A. 7. d. Raised stratified eye bead. Glass, Egypt, XVIIIth to XIXth Dynasty.
A. 7. e. 1. Horned stratified eye bead. Glass, Italy, Villanovan.
A. 7. e. 2. Horned stratified eye bead. Glass, Egypt, XXIIIrd Dynasty.
A. 7. f. Double stratified eye bead. Glass, Egypt, XXIIIrd Dynasty.
A. 8. a. Combined stratified and impressed eye bead. Glass, Italy, Etruscan.
A. 8. b. 1. Combined stratified and plain spot eye bead. Glass, Mediterranean, 600 B. C.

c. *Faience and pottery beads with plain painted spots.*

d. *Faience, frit, and pottery beads, with raised ring eyes.*

Family A. 4. *Ring and dot stone eye beads.* Fig. 34 a, A. 4.

Family A. 5. *Ring and dot faience and frit eye beads.*

a. *Flush.* Fig. 34 a, A. 5. a.

b. *Incised or raised.* Fig. 34 a, A. 5. b.

Family A. 6. *Impressed glass eye beads.*

a. *Eyes of flush impressed single rings.* Fig. 58.

b. *Eyes of flush impressed single ring and central spot.* Fig. 34 a, A. 6. b.

c. *Eyes of two or more concentric rings.* Fig. 34 a, A. 6. c.

d. *Eyes of two or more concentric rings combined with waves, spots, or other decorations.* Fig. 34 a, A. 6. d.

e. *Eyes of single rings not pressed flush.*

f. *Horned impressed eye beads.*

    (1) With four horns. Fig. 34 a, A. 6. f. 1.

    (2) With five or more horns. Fig. 59.

Family A. 7. *Stratified eye beads.*

a. *Flush eyes well separated.*

    (1) Beads with small perforation. Fig. 34 a, A. 7. a. 1.

    (2) Beads with large perforation. Fig. 34 a, A. 7. a. 2.

b. *Flush eyes hardly any matrix showing.* Fig. 34 a, A. 7. b.

c. *Triangular form.* Fig. 61.

d. *Raised stratified eyes.* Fig. 34 a, A. 7. d.

These are intermediate between A. 7. a. and A. 7. e.

e. *Horned stratified eyes.*

    (1) With four horns. Fig. 34 a, A. 7. e. 1.

    (2) With more than four horns. Fig. 34 a, A. 7. e. 2.

f. *Double beads with stratified eyes.* Fig. 34 a, A. 7. f.

g. *Beads with stratified eyes combined with other decoration.*

Family A. 8. *Beads with stratified eyes combined with impressed or spot eyes.*

a. *Beads with stratified eyes in which the central spot has a series of impressed rings.* Fig. 34 a, A. 8. a.

b. *Beads in which some of the eyes are stratified and some plain spots.*

    (1) Raised spots. Fig. 34 a, A. 8. b. 1.

    (2) Flush spots. Fig. 34 b, A. 8. b. 2.

c. *Beads in which the eyes have an impressed ring outside, and a stratified part in centre.* Fig. 34 b, A. 8. c.

d. *Beads with impressed rings with eyes stratified upon them.*

These are formed by impressing a wide ring and then applying spots on the top of the ring, by the process used for stratified eyes.

Family A. 9.   *Inserted cane eye beads.*

  a. *Beads with inserted cane eyes, well separated by matrix.*

    1. *Flush eyes.*   Fig. 34 b, A. 9. a.

    2. *Raised or horned eyes.*

  b. *Large disc beads with inserted cane eyes.*   Fig. 34 b, A. 9. b.

  c. *Beads made entirely of eye-canes, or in which there are so many that the matrix is scarcely visible.*   Fig. 34 b, A. 9. c.

  d. *Double strip eye beads.*   Fig. 54.
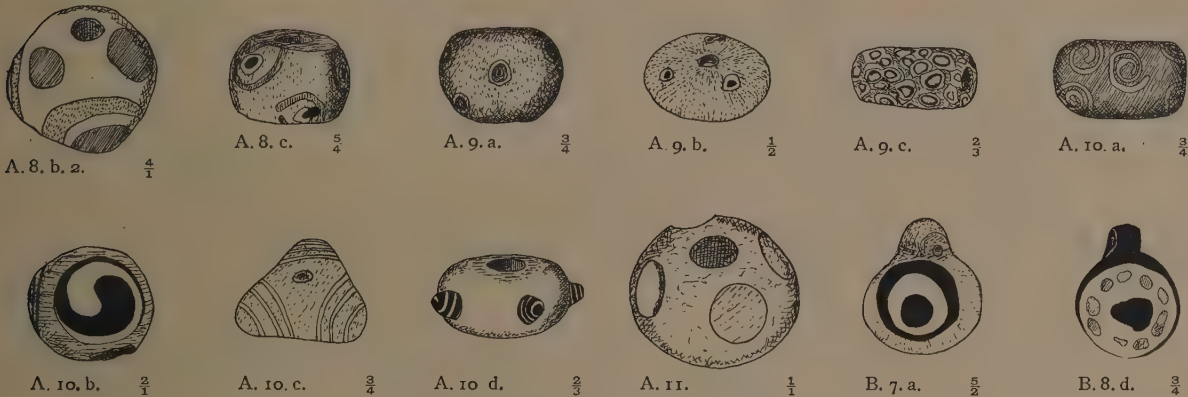
Fig. 34 b.   GROUP XLVI (*continued*).

A. 8. b. 2. Combined stratified and plain spot eye bead.   Glass, Egypt, XXIIIrd Dynasty.
A. 8. c. Combined stratified and impressed eye bead.   Glass, Cumae, 300 B.C. ?
A. 9. a. Inserted cane eye bead.   Glass, Italy, Etruscan.
A. 9. b. Disc bead with cane eyes.   Glass, Cumae, 100 B.C.
A. 9. c. Inserted cane eye bead.   Glass, Cumae, A.D. 100.
A. 10. a. Spiral eye bead.   Glass, near Cambridge, Roman Period, or earlier.
A. 10. b. Spiral eye bead.   Glass, Egypt, XVIIIth to XXth Dynasty.
A. 10. c. Triangular spiral eye bead.   Glass, Italy, Villanovan.
A. 10. d. Horned spiral eye bead.   Glass, Cheshire, Roman Period, or earlier.
A. 11. Metal eye bead.   Bronze, Oxfordshire, Pre-Roman.
B. 7. a. Stratified eye pendant.   Glass, Egypt, XVIIIth to XXth Dynasty.
B. 8. d. Stratified eye pendant.   Glass, Egypt, XVIIIth to XXth Dynasty.

These are made of elaborate canes so arranged that, when the bead is cut off, it shows lines at right angles to the axis on part of the surface, whilst the parts where the strips are cut off show spot or eye decoration.

  e. *Folded beads made from eye canes.*

  f. *Chequer beads.*

    1. *Made from simple canes.*

    2. *Made from elaborate canes.*   Fig. 80.

  g. *Beads with inserted cane eyes combined with canes of other patterns.*

Family A. 10.   *Beads with spiral eyes.*

  a. *Beads with flush spiral eyes, made of impressed threads.*   Fig. 34 b, A. 10. a.

b. *Beads with flush spiral eyes, made of two sorts of glass twisted together*
Fig. 34 b, A. 10. b.

c. *Triangular beads with spiral eyes at the angles.* Fig. 34 b, A. 10. c.

d. *Beads with horned spiral eyes.* Fig. 34 b, A. 10. d.

Family A. 11. *Metal eye beads.* Fig. 34 b, A. 11.

Subgroup B. Pendants.

There are a number of pendants belonging to this group. They mostly belong to families B. 7. and B. 8. Fig. 34 b, B. 7. a and B. 8. d.

Group XLVII. *Zone, Striped, Wave, and Chevron Beads*

Most of the beads in this group are of regular form and so have already been included by their shape in divisions I and II. To describe this, the names, letters, etc., given to them in those divisions should be used. As, however, their decoration is so much more important than their shape, they are classed together in this group, which includes most of the beads with line decoration only.

If they have spot decoration as well as line decoration they are included in the last group, spot and eye beads, no. XLVI. Also beads with spiral lines are not included here, but in group XVIII, Spiral beads.

Fuller particulars of many of these beads are given in Part VI on Decoration.

Subgroup A. Beads.

Family A. 1. *Zone beads.*

Beads divided into zones by lines, etc., round the perimeter concentric with the axis.

a. *Glass.* Fig. 68.

b. *Onyx.* Fig. 35, A. 1. b.

c. *Stone, crystal, etc., with lines cut round.* Fig. 35, A. 1. c.

Family A. 2. *Longitudinally striped beads.*

a. *Parallel stripes of plain canes.* Fig. 35, A. 2. a.

b. *Parallel stripes of elaborate canes.* Fig. 67.

c. *Annular and short bicone beads with radial stripes.* Fig. 35, A. 2. c.

d. *Beads of stone, amber, etc., carved with longitudinal lines.*

e. *Faience sector globe beads.* Fig. 84.

Family A. 3. *Wave beads.*

a. *Single wave.* Fig. 75.

b. *Double wave adjacent.* Fig. 76.

c. *Double wave, superimposed.* Fig. 77.

d. *Multiple waves.*   Fig. 35, A. 3. d.

e. *Beads of stone, amber, etc., carved with waves.*

f. *Faience beads with moulded or painted waves.*

In many of the glass beads of this family the waves have pointed ends and are practically chevrons, but they are always made by superimposing a thread, which is often impressed, but is never wire-drawn.   The wire-drawn beads are included in family A. 7.
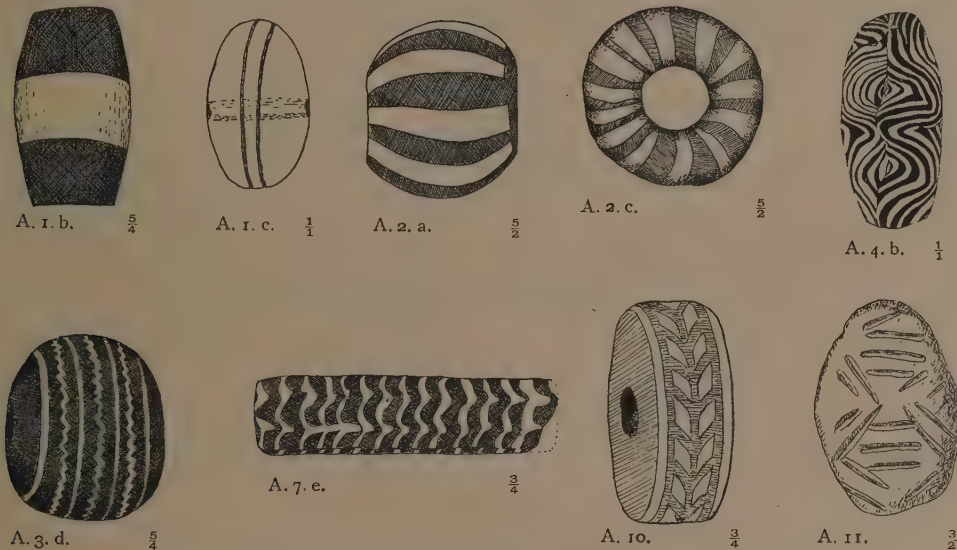
Fig. 35.   GROUP XLVII.   Zone, Striped, Wave, and Chevron Beads.

A. 1. b. Zone bead.   Onyx, Mesopotamia, before 700 B.C.
A. 1. c. Zone bead.   Crystal, Anglo-Saxon.
A. 2. a. Longitudinally striped bead.   Glass, Crimea, 700 B.C. ?
A. 2. c. Radially striped bead.   Glass, Syria, 300 B.C. ?
A. 3. d. Multiple wave bead.   Glass, Sweden, A.D. 800.
A. 4. b. Folded scrabble bead.   Glass, Taxila, India.
A. 7. e. Irregular wire-drawn or combed bead.   Glass, Italy, 9th century B.C.
A. 10. Faience copy of a combed bead.   Tel el Amarna, XVIIIth Dynasty
A. 11. Bead with irregular straight line decoration.   Stone, Ur, Neolithic.

Family A. 4.   *Scrabble beads.*

a. *Wound scrabble beads.*   Fig. 79.

These are formed by winding a thread of glass in an irregular manner round a matrix.   The pattern may be either raised or impressed.

b. *Folded scrabble beads.*   Fig. 35, A. 4. b.

These are made by folding over layers of glasses of different colours, in an irregular manner.

Family A. 5.   *Cane chevron beads.*   Fig. 66.

Family A. 6.   *Zigzag beads.*   Fig. 71.

Family A. 7.   *Wire-drawn or combed beads.*
    a. *Wire-drawn chevron.*   Fig. 72.
    b. *Wire-drawn scallop.*   Fig. 73.
    c. *Wire-drawn double scallop.*
    d. *Wire-drawn ogee or feather pattern.*   Fig. 74.
    e. *Slightly and irregular wire-drawn.*   Fig. 35, A. 7. e.
Family A. 8.   *Glass beads imitating wire-drawn or combed patterns.*

This family contains beads in which elaborate longitudinally striped canes have been applied to a matrix so as to imitate wire-drawn or combed chevron beads.

Family A. 9.   *Beads carved in imitation of wire-drawn patterns.*
Family A. 10.   *Faience beads copying wire-drawn patterns.*   Fig. 35, A. 10.
Family A. 11.   *Beads with irregular decoration consisting of straight lines.* Fig. 35, A. 11.

Group XLVIII.   *Sundry Beads*

Subgroup A.   *Beads.*

Family A. 1.   *Plano-conical beads.*

These beads are similar to plano-convex beads, but the curved surface of the latter has become a cone.
    a. *Oblate.*
    b. *Circular.*
    c. *Ellipsoidal.*   Fig. 36, A. 1. c.

Family A. 2.   *Panelled beads.*
    a. *Beads with circular panels.*   Fig. 36, A. 2. a.   These beads are carved so as to leave circular panels standing up.   Usually there are six panels, one at each end and four round the perimeter, one at every 90 degrees.
    b. *Beads with sector panels.*   Fig. 36, A. 2. b.   These beads are carved so as to leave alternate sectors of the bead raised or depressed.   It is usual to divide the perimeter into six or eight sectors.
    c. *Beads with U-shaped panels.*   Fig. 36, A. 2. c.   These beads are carved so as to leave U-shaped panels standing up.   There are usually four panels.
    d. *Beads with lozenge-shaped panels.*   Fig. 36, A. 2. d.   These beads are carved away so as to leave lozenge-shaped and triangular panels standing up.

A spiral bead such as that illustrated in fig. 16, A. 2. b RLS. 3 might also be considered a lozenge panel bead, but in that the spiral is obvious and an important feature of the bead, whilst in the beads of this class the spiral scarcely exists.

Family A. 3.   *Glass string beads.*   Fig. 36, A. 3.

These beads are either entirely made of strings of ornamented glass, or else

are decorated with them.   In the latter case the strings are not pressed flush into the matrix, but stand out as a prominent feature of the bead.   They are frequently found in Ireland and are generally considered to be of the late Iron Age, but it has recently been suggested that they may be later.

A. 1. c. $\frac{1}{1}$ A. 2. a. $\frac{5}{4}$ A. 2. b. $\frac{5}{4}$ A. 2. c. $\frac{7}{8}$ A. 2. d. $\frac{7}{8}$ A. 3. $\frac{3}{2}$

A. 4. a. $\frac{2}{3}$ A. 5. $\frac{3}{4}$ A. 6. $\frac{1}{1}$ A. 7. $\frac{3}{1}$ B. 8. $\frac{3}{2}$
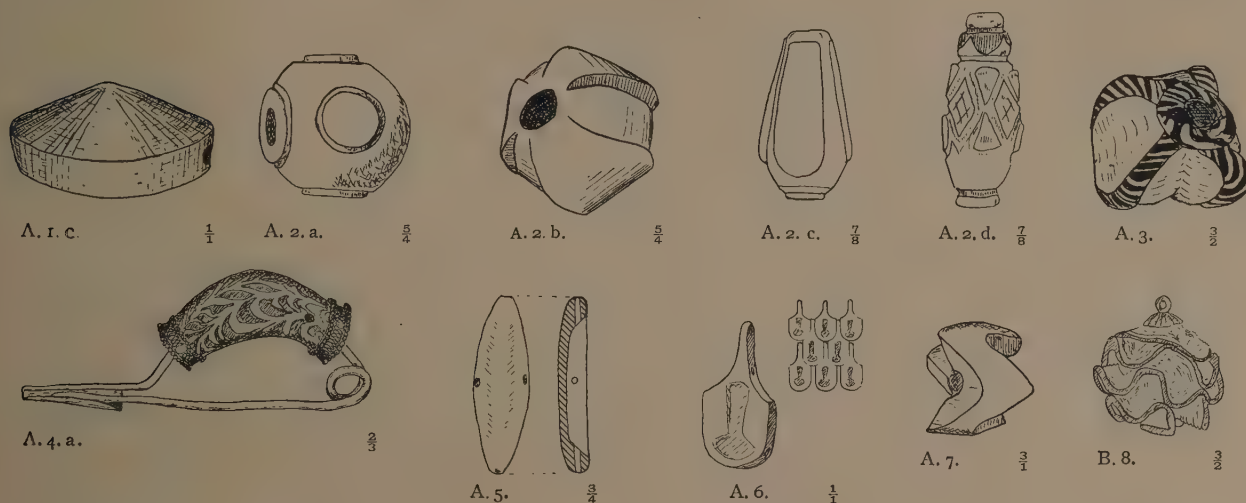
Fig. 36.   GROUP XLVIII.   Sundry Beads.

A. 1. c. Plano-conical bead.   Quartzite, Ur, before 600 B. C.
A. 2. a. Panelled bead.   Glazed quartz, Persia.
A. 2. b.   „   „
A. 2. c.   „   „
A. 2. d.   „   „
A. 3. String bead.   Glass, Ireland, Celtic Period.
A. 4. a. Leech bead.   Glass on gold mount, Yugoslavia, 900 B. C.
A. 5. Boat bead.   Faience, Tel el Amarna, XVIIIth Dynasty.
A. 6. Feather diaper bead.   Faience, Tel el Amarna, XVIIIth Dynasty.
A. 7. Chain bead.   Glass, Modern.
A. 8. Ribbon bead.   Glass, Modern.

Family A. 4.   *Leech beads.*
     These beads are made to fit on fibulae, and as many of them resemble the 'leech' type fibula, they are called leech beads.
     a. *Glass leech beads.*   Fig. 36, A. 4. a.   These are usually very ornate having patterns of chevrons or scallops round them.
     b. *Amber and ivory leech beads.*   These are generally built up of several pieces.   They may be of amber only, or sections of amber may be separated by plates of gold or bronze, or may alternate with sections of ivory.   When ivory is used it is sometimes elaborately inlaid.
     Family A. 5.   *Boat beads.*   Fig. 36, A. 5.
     These are long boat-shaped faience beads with the back hollowed out. They have cross perforation.

Family A. 6. *Feather diaper beads.*   Fig. 36, A. 6.

These beads have four perforations, and are of such a shape that when threaded together they make the diaper pattern supposed by Egyptologists to represent feathers.

Family A. 7. *Chain beads.*   Fig. 36, A. 7.

These make a chain, the points of one bead fitting into the hollows of the next.

Family A. 8. *Glass ribbon beads.*   Fig. 36, B. 8.

These beads are hollow glass balls entirely covered with glass ribbon. The one illustrated is mounted as a pendant.

Family A. 9. *Sundry mosaic beads.*

Mosaic beads, that is, beads built up out of two or more different coloured glasses or faience, usually have the colours arranged so as to make a definite pattern, in which case they are included in the group to which the pattern belongs.

There are, however, some in which the designs are so irregular that they cannot be easily placed in other groups, and these are included in this family. Examples of these are the swirled glass beads, fig. 49, and the blotched beads, fig. 50.

Family A. 10. *Splashed faience beads.*   Fig. 82.

In these spots and patches of coloured glaze are irregularly splashed on a glaze of a different colour.

Family A. 11. *Etched carnelian and chalcedony beads.*

The important thing about these beads is the way in which they are made. The designs are usually simple, one of the most elaborate is shown in fig. 42.

Family A. 12. *Bent beads.*
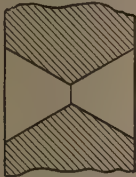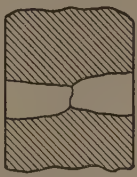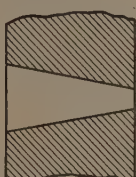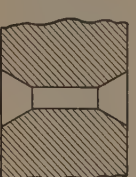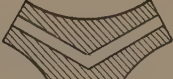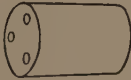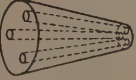
These are usually cylindrical faience beads which have been bent, or beads carved in imitation of such cylinders. They are approximately the same diameter all along, which distinguishes them from the leech beads in family A. 4. of this group.

DIVISION IV. IRREGULAR BEADS AND PENDANTS

This division is divided into two groups as follows:—

Group XLIX. *Irregular Beads and Pendants, Perforated only*

The beads and pendants in this group are made out of natural pieces of stone, amber, etc., in which no attempt has been made to grind the surface. They are, however, perforated.   The perforation in some cases is also natural.

SINGLE PERFORATIONS.

Type I. Double Cone.	Type II. Drilled from Both Ends.	Type III. Single Cone.	Type IV. Plain.	Type V. Chamfered.
Bored from both ends. No attempt at parallel hole.	Drilled from both ends. Parallel or slight cone, if present, accidental	Conical Bored from one end.	Approximately parallel, bore from one end.	Conical at ends, parallel in centre.

SINGLE PERFORATIONS.

Type VI. Large.		Type VII Tubular	Type VIII. V Perforation.	
a. Medium Large.	b. Extra Large.		a. Bored from one surface.	b. Bored from two surfaces.
Holes more than ¼ and less than ½ diameter.	Hole more than ½ diameter	Cylinder with so large perforation that it becomes a tube.	Both holes bored from one surface.	Holes bored from two surfaces which are not parallel.

SINGLE PERFORATIONS.   MULTIPLE PERFORATIONS.

Type IX. Corner		Type X. In one Plane.		
a. Single	b Double	a. Parallel	b. Converging.	c. Tee.
Hole bored from one end to adjacent side.	Holes bored from two ends to adjacent side			

MULTIPLE   PERFORATIONS.

Type X. In one Plane				Type XI. Not in one Plane.	
d Y	e. Rectangular Cross.	f. Oblique Cross.	g. Combined Converging and Y.	a. Parallel.	b. Converging.

Group L.   *Irregular Beads and Pendants, Perforated and Roughly Ground*

These are made out of irregular pieces of material, and in addition to being perforated, are roughly worked over part or all of the surface. They are divided into the following families :—

Family A. 1.   *Beads ground or chipped on ends only.*

Family A. 2.   *Beads ground or chipped over the whole or greater part of the surface.*

Family B. 1.   *Pendants ground or chipped over a small portion of the surface only.*

Family B. 2.   *Pendants ground and chipped over the whole or greater part of the surface.*

PART III. PERFORATION

Perforations can be divided into eleven types as follows :—

Type I.   *Double cone perforation.*   This perforation is bored from both ends, with conical holes. In this type the cone has a considerable angle, and no attempt is made to make the hole parallel.

Type II.   *Drilled from both ends perforation.*   This type is bored from both ends, generally with a sort of drill. The holes are parallel or only slightly conical, the coning, if present, being accidental.

Type III.   *Single cone perforation.*   This perforation is bored from one end and is conical.

Type IV.   *Plain perforation.*   This perforation is bored from one end and is approximately parallel.

Type V.   *Chamfered perforation.*   This perforation is conical at the ends but the central part is parallel.   A modified form is only conical at one end.

Type VI.   *Large perforation.*   This type is subdivided as follows :—

a. Medium large ; when the hole is more than one quarter, and less than half the diameter of the bead.

b. Extra large ; when the hole is half the diameter of the bead or larger.

Type VII.   *Tubular perforation.*   This type contains beads of cylindrical form, in which the perforation is so large that the bead becomes a tube ; such beads may be bored out of the solid material, or they may be made from sheet metal.   They are also occasionally moulded.

Type VIII.   *V-perforation.*

a. Perforation bored at different angles from the same end, side, or base.

b. Perforation bored from two ends which are not parallel.

Type IX.   *Corner perforation.*

a. *Single.*   In this case the perforation starts at one of the ends, and comes out on one of the sides.

b. *Double*. In this case the perforation is the same as the last, but in addition a second hole starting near the further extremity of the same side comes out at the other end.

Type X. *Multiple perforations in the same plane.*

a. Parallel perforation.
b. Converging perforation.
c. T-perforation.
d. Y-perforation.
e. Rectangular cross-perforation.
f. Oblique cross-perforation.
g. Combination of converging and Y-perforation.

Type XI. *Multiple perforations not in the same plane.*

a. Perforations parallel, arranged in triangle.
b. Perforations converging.

The above types of perforation are illustrated on plate IV.

PART IV. COLOUR

The question of colour is very important, and I hoped to have had a chart printed with this paper. A chart was prepared, but the expense of reproducing it in such a way that the different impressions would be the same, combined with the uncertainty as to how long the colours would remain without changing, necessitated the plan being abandoned.

The work now being carried out at the National Physical Laboratory by Mr. J. Guild shows that it is possible accurately to describe a colour by a mathematical formula, and it is to be hoped that before long a chart will be produced, with graduated variations of hue, saturation, and brilliancy, in which each colour is recorded in this way.

For bead-work I think that a chart with about one hundred colours, each with three or four patches of different brilliancy, and all collected on two sheets, about 15 in. by 12 in., would be the most suitable form.

Several charts have been made in which the colours are arranged on a large number of sheets. The disadvantage of this is that it takes too long to match a colour and also that only an approximate match can often be made, as different parts of a bead frequently vary considerably in colour.

PART V. MATERIAL

The materials used for the manufacture of beads can be divided into three divisions: I. Natural materials; II. Metals; III. Artificial materials.

I. *Natural Materials*. These are materials which once they are found only require making into beads. Some, as for instance many shells and seeds, need very little doing to them, whilst stones with natural holes through them, suitable for wearing as beads, are frequently found.

Most of the natural materials are included in the following five groups:

   1. Stone, including crystals.
   2. Jet, lignite, Kimmeridge shale, amber, and natural gums.
   3. Shell, including complete shells, pearls, egg-shells, etc.
   4. Wood, including seeds, pith, straw, etc.
   5. Teeth, ivory, bone, horn, skin, and hair.

II. *Metals.* These generally need to be smelted or otherwise prepared before they can be made into beads.

III. *Artificial Materials.* These materials had to be manufactured. The most important are included in the following nine groups:

1. Glass.	7. Wax.
2. Frit.	8. Paper.
3. Faience.	9. Sundry compositions: celluloid, cement, bakerlite, imitation amber, etc.
4. China.	
5. Unglazed pottery, clay.	
6. Lacquer.	

I. *Natural Materials.*

   1. *Stone.* Very large numbers of stones are used for beads, and it is often difficult to say out of what stone a bead has been made. It is sometimes an assistance to test either the hardness or the specific gravity.

The following table gives the hardness and the specific gravity of some of the stones used:

Stone.	Hardness.	Specific Gravity.	Stone.	Hardness.	Specific Gravity.
Sapphire	9	4·2-3·9	Flint	7	2·65
Oriental amethyst	9	4·2-3·9	Jasper	7	2·65
Oriental emerald	9	4·2-3·9	Quartz	7	2·65
Spinel	8	3·8	Jade	7-6·5	3·3
Topaz	8	3·64-3·5	Opal	6·5-5·5	2-2·3
Beryl	8-7·5	2·7-2·6	Green feldspar	6	2·6-2·4
Emerald	8-7·5	2·7-2·6	Turquoise, Callaïs	6	3-2·75
Tourmalin	7·5-7	3·2-2·9	Serpentine	5·5-2·3	2·6-2·5
Jacinth	8-7	4·5	Lapis lazuli	5	2·4
Garnet	7·5-6·5	4·2-3·6	Arragonite	3·75	2·9
Agate	7	2·65	Marble	3·75-3	2·9-2·7
Amethyst	7	2·65	Malachite	3·5	3·8
Bloodstone	7	2·65	Calcite	3	2·7
Chalcedony	7	2·65	Steatite	1·5-1	2·4
Carnelian	7	2·65			

   2. *Jet, lignite, Kimmeridge shale, amber, and natural gums.* These can frequently be told by their very low specific gravity, that of jet and lignite being from 1·2–1·4, and the hardness being 2. The specific gravity of amber is from

1·03–1·08, and the hardness from 2–2·5. It is extremely difficult to distinguish between the different varieties of natural gums.

3. *Shell*. Great numbers of shells are used to make beads. Some are used as complete shells; amongst others, cowries (cypraea), olive, cone, scallop, and helix are used in this way. Others, such as tridachna and mother-of-pearl, are cut to various shapes. Pearls and coral are included in this group, also egg-shells.

4. *Wood*. Woods and seeds of a great many varieties are used in the manufacture of beads. When describing a bead it is advisable to say what wood or seed is used, if it is possible to do so.

5. *Teeth, etc*. Teeth when small are usually made into beads by simply perforating them. Larger teeth are sometimes treated in the same way, but sometimes they are carved into special shapes. When possible it is advisable to state to what animal they belong.

Ivory may be either true ivory or morse ivory; the specific gravity of true ivory is 2·07.

Bone, horn, and skin are usually carved to some special form, and it is difficult to state from what animal they come, but when known it should be stated. Small bones, however, are often used whole (see page 39).

II. *Metals*.

Most of the metals known to the ancients have been used for making beads. They usually had to be smelted, but occasionally nuggets of gold and lumps of meteoric iron were found in a form suitable for working.

III. *Artificial Materials*.

1. *Glass*. Glass is a vitreous compound that has a conchoidal fracture. It is a combination of silica with lime or lead, and an alkali such as soda and potash.

Many colours and varieties of glass are made and used for beads. Some of these have great power of resisting corrosion and therefore keep a polished surface for a very long time. Other glasses corrode much more rapidly; in some cases this gives brilliant iridescent colours, but in others the surface corrodes away, and the material at first sight looks like a piece of clay.

2. *Frit*. Frit is a partially mixed material, consisting of unmelted substances held together by a cement. It may consist of materials which would make a glass but have been only partly melted.

Paste. This term is frequently used in referring to glass. It has no meaning applied to beads. The only vitreous substance that can correctly be called paste is a transparent glass of very high refractive index, made in comparatively

recent years, and used for making artificial diamonds. I do not think this is ever used for beads. Some forms of Saxon glass, when very corroded, look like pottery, and are often erroneously described as paste. It is a misleading term, as really they are true glass. Then, again, soft blue frit is called paste by some people, whilst others apply the term to all sorts of pottery and faience.

3. *Faience*. This is earthenware which has been glazed with a silica enamel. Originally the term was applied to a glazed earthenware made at Faenza, but it has become a term frequently used for almost any form of glazed earthenware and especially for beads.

Glaze. Glaze is a form of glass. It can vary very much in its composition, but it always contains silica and an alkali.

4. *China*.   5. *Unglazed pottery*, *clay*.

China or porcelain, and earthenware or unglazed pottery, are substances largely composed of clay. Porcelain, however, usually has the ingredients in finer particles and, having been heated to a higher temperature, many of its particles have become transparent, thus producing a translucent material. The difference between porcelain and earthenware is one of translucency.

Earthenware can be described as any clay baked sufficiently to stick together, but which has not been heated sufficiently to melt its ingredients.

6. *Lacquer*. Lacquer is prepared from the Lac Tree, *Rhus Vernicifera*. Large numbers of coats are usually applied by means of a brush or spatula. These are sometimes moulded or carved to shape before the final decoration is put on.

The core of lacquer beads is usually wood, but other materials are sometimes used.

PART VI. DECORATION

In considering the decoration of beads it is best to divide them according to the material of which they are made.

1. Beads of Natural Materials

The original material was often of such a nature that shaping it into a bead gave it a decorative effect. This, strictly speaking, is not decoration in the sense that I refer to.

Cameo decoration. When the form of the bead has been altered by irregular cutting so as to give some specially desired effect, it is called *Cameo decoration*. A good example of this is the cat's-eye bead of Mesopotamia (fig. 34 a, A. 1. a). In this the onyx is carved away so as to give the effect of a black centre with a white ring round it. They are also made with double eyes. A specimen with double eye, carved from three layers of onyx, is shown in fig. 37.

Carved decoration. When a bead has been carved with a pattern, which has no reference to any natural decoration there may be on the material, it is called *Carved decoration.* Two of the best-known forms of this, other than the alterations in shape referred to under Classification, are the *spot* (fig. 38) made by a drilled hole, generally with a conical point, and the *ring and dot* (fig. 39). Both these motives were usually repeated several times on the bead.

Carved decoration has also been applied to metals and to some of the artificial materials.

Engraved decoration. Beads were frequently cut in intaglio. These are called *Engraved beads* (fig. 40). In most the designs are elaborate and not easy to classify, in which case they should be described individually.
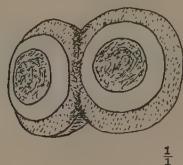
Fig. 37. Double cat's-eye bead. Onyx, Assyria, 2000 B.C.
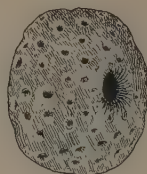
Fig. 38. Drilled spot bead. Stone, Ireland, Celtic Period.
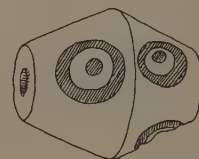
Fig. 39. Ring and dot bead. Stone, Cyprus, 700 B.C.

When, however, they have any form of writing on them they are called *Inscribed beads* (fig. 41). Inscribed beads were not only engraved but also, when made of wood or some suitable material, the writing was sometimes painted on. Painted inscribed beads were, however, more frequently made in faience (see page 70).

Inlay decoration. This is another form of carved decoration in which an incised pattern was carved, and then this pattern was filled in with pieces of another material cut to fit.

Enamelled, glazed, and painted decoration. When a bead has been covered with a thin layer of vitreous enamel or glaze, it is called a *Glazed bead.* Many natural stones were glazed. The best-known examples are the glazed steatite and glazed quartz beads and pendants of Egypt and Persia.

When a bead has had comparatively deep holes or lines filled in with vitreous enamel, it is called an *Enamelled bead.*

When a bead has a design painted on the surface with some form of pigment, which is not fused, it is called a *Painted bead.*

Etched decoration. Some beads made of carnelian or chalcedony, have had designs chemically produced on them by etching and heating. Such beads are called *Etched carnelian or chalcedony beads* (fig. 42).

Etched-bone decoration. In this method of decoration the surface was

scratched or burnt away with a hot metal point. This was done on bone beads during the Bronze Age, specimens having been found in a few places in England (fig. 43). Such beads are called *Etched-bone beads*.

Rocked-line decoration. This form of decoration is somewhat allied to the bone etching, and somewhat to engraved decoration. For this process a point
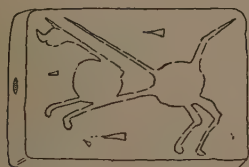
Fig. 40. Engraved bead. Steatite, Hittite, 600–400 B.C.

Fig. 41. Inscribed bead. Glazed steatite, Egypt, XVIIIth Dynasty.
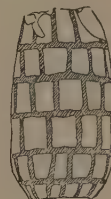
Fig. 42. Etched carnelian bead. Ur, Mesopotamia, Early Period.

Fig. 43. Etched bone bead. Yorkshire, Bronze Age.
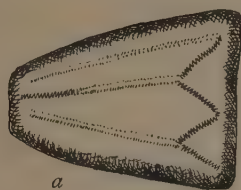
Fig. 44. Terminal spacing bead with rocked line decoration. Jet, Burwell Fen, Bronze Age.
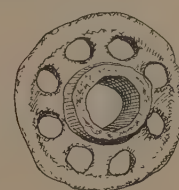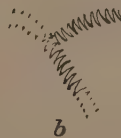
Fig. 45. Bronze wheel bead. Italy, Bronze Age.

was taken, which was chisel edged in one direction and curved in the other; it was about one-twentieth of an inch wide. This was rocked backwards and forwards along the surface of a jet bead, in such a manner that it made a line about one-twentieth of an inch wide, consisting of a number of sharp zigzag cross-lines. A specimen is shown natural size in fig. 44 *a*; a portion of the line magnified is shown in fig. 44 *b*.

2. BEADS MADE OF METAL

Cast decoration. Beads which have been cast with a pattern on them, the pattern having been made in the mould, and which have not had the surface worked on after casting, are called *Cast beads*. One form which appears to have been left from the casting is the Terramara Bronze Wheel Bead (fig. 45). It belongs to group XX. A. 2. c.

Carved decoration. Sometimes a bead, which had the pattern cast on it, has had the surface finished by chasing, in which case it is best to class it under carved decoration, such beads being called *Chased beads*.

The remarks made with reference to carved beads in natural materials apply also to carved metal beads.

Inlaid decoration. Beads in which the surface has been carved or stamped with an incised or depressed pattern, which pattern has been filled with another material, are called *Inlaid beads.*

In one special form of this an undercut groove was chased in the metal bead, and fine gold or silver wire was hammered into the groove. Such beads are called *Damascene beads.*

Stamped decoration. Metal beads if made of fairly thin metal have been

Fig. 46. Stamped metal bead. Japan.   Fig. 47. Repoussé bead. Gold, Cyprus, 500 B. C.

embossed in two ways. For both methods it was necessary to make the bead hollow and in two parts, which were finally joined together. One method was to press or stamp it to shape between two tools which had on them the shape and pattern that were required on the bead. This is called stamped decoration, and beads so made are called *Stamped* or *Pressed beads* (fig. 46).

The other method was to emboss the pattern, by hammering the bead with small tools, both from inside and outside. This is called *Repoussé decoration*, and such beads *Repoussé beads* (fig. 47).

Etched decoration. To etch a bead the metal was covered with some acid-resisting varnish. The varnish was then cut away in the required pattern, and the bead was painted with or dipped into acid. This removed the surface where the varnish had been cut away, and left an etched pattern on the bead. Beads treated in this way are called *Etched metal beads.*

Gilded and plated decoration. In both these cases the metal of the bead was covered either completely or in part with gold or some other metal. When this layer is extremely thin, as in the case of a chemical deposit or a covering of gold leaf, it is called *Gilded decoration*, and a bead so treated is called a *Gilt bead.*

When, however, the superimposed metal has considerable thickness and was bent round or soldered to the matrix, it is said to be *Plated,* and a bead so treated is called a *Plated metal bead.*

Filigree decoration. This is a form of decoration by means of thin wires. They may be only soldered together, or they may have a matrix on to which they are fixed. Beads made in this way are called *Filigree beads.* See group XXIV, fig. 22.

Enamelled decoration. There are several forms of this.

When a vitreous glaze or enamel has been fused over the whole or a large part of the surface of a bead, without any elaborate pattern on it, it may be called *Glazed,* but it is more usual to call metal beads which are coated with any form of glaze or enamel *Enamelled beads.*

Fig. 48. Cloisonné bead.
Japan, XVIIIth century.
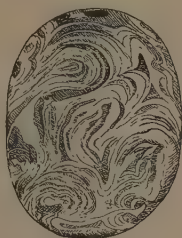
Fig. 49. Swirled glass bead.
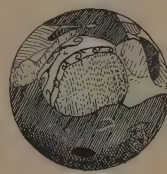
Fig. 50. Blotched glass bead. Roman.

Another form of enamelled bead is the *Limoges enamelled bead.* In this form the enamel was painted on as a pattern or picture and then fired. Sometimes it was necessary to fire it a large number of times. This class of enamel, though very rarely met with on beads, is rather more common on pendants.

When the surface has been cut away and the hollows filled in with enamel, it is called *Champlevé enamel.*

When the surface has been built into cloisons by soldering small wires on to it, and these cloisons have then been filled with enamel, it is called *Cloisonné enamel,* and beads so made are called *Cloisonné beads* (fig. 48). This form of decoration is extremely common in oriental beads.

2. Beads made of Artificial Materials

The artificial material that has the greatest variety of technique, both in its original manufacture and its subsequent decoration, is glass. It will therefore be considered first.

1. *Beads made of Glass*

Some classes of decoration depend entirely on the original method in which the glass was made.

Swirled decoration. Two or more glasses of different colours were melted and stirred together to a slight extent, and then moulded into beads. This gave

the effect of lines of different colours bending in and out in a quite irregular manner.   Beads made in this manner are called *Swirled glass beads* (fig. 49).

In some cases different glasses are melted on the surface of the bead and swirled round after the matrix has been made.

Blotched decoration.   In this case a number of broken fragments of different coloured glass were taken and heated until they were plastic, and then pressed together and moulded into the required shape.   The result was to form a bead with a large number of blotches of different colours.   Such beads are called *Blotched glass beads* (fig. 50).

Most of the decoration of glass beads, however, was applied during the manufacture.   As this is classified largely according to the method of manufacture of the bead, it is necessary first to consider how this was done.

There were six chief methods of making glass beads:

1. *Wire-wound beads.*   A thin stick of glass heated until it had much the consistency of toffee was wound round a wire.   During the process the glass was pulled out into a thread, and there is frequently a projection on the bead showing where this thread was broken off.   When, however, as often happens, the bead has been reheated for subsequent decoration, this projection generally disappears. Beads made in this manner are called *Wire-wound.*

2. *Cane beads.*   To make these the glass was made into a rod or tube which was called a cane.   These canes were sometimes made of one glass only; at other times they were made of different coloured glasses arranged in a pattern.

To make a bead, a cane, usually tubular, was selected of approximately the same diameter as the bead required.   A piece the length of the bead was cut off this cane.   In some cases this was used as a bead without any further work on it.   In other cases it was finished by either grinding or reheating. Beads made in this manner are called *Cane beads.*

The method of making tubular canes is of some interest.   At the present time they are made by taking a piece of molten glass on the end of a blowpipe, and slightly blowing it out so as to make it hollow.   Whilst it is still hot a rod is attached to the other end, and it is stretched out as rapidly as possible so as to make a long tube before it cools.   This process necessitates the use of a blow-pipe.   It appears, however, that the method of working glass with a blowpipe was not invented more than a century or so before the Christian era, so that it has been taken for granted that all beads made of tubular cane must be later than that date.   But small glass tubes have been found in the glass factory at Tel el Amarna, which is the earliest glass factory known and dates from the XVIIIth dynasty. By examining fragments of these I have been able to trace the method of their manufacture.   A strip of glass of considerable thickness, and wide enough to fold round a wire, was, whilst in a plastic condition, folded round and the edges

fused together so as to make a tube. Such tubes are called *Folded canes*. These were sometimes reheated and pulled out into small tubular canes, such as those found at Tel el Amarna (fig. 51 *a*).

Pieces broken from these make long cylindrical beads, and a necklace entirely consisting of such beads simply broken off canes has been found in a New Kingdom grave at Abydos (fig. 51 *b*).

3. *Folded beads.* When, however, the folded cane is not pulled out into a small tube, but beads are cut from it and ground to shape they are called

Fig. 51. *a*, Glass tubular cane. Tel el Amarna ;
b, glass tubular bead. Abydos, XIXth Dynasty.

Fig. 52.   Fragments of folded glass canes.
Tel el Amarna.

Folded beads.   Fig. 52 *a* shows a folded cane of cuprous oxide glass ready to grind into one of the long pear-shaped beads so characteristic of the XVIIIth dynasty.   From the way in which the end has been nicked down whilst hot, so as to show where to break it off, it looks as though the strip was longer when folded, probably at least twice as long.   In the same necklace are found beads made in this manner of one sort of glass, whilst beads of the same shape but another glass are wire-wound.

Fig. 52 *b* shows a piece cut off a larger cane suitable for grinding into a spherical bead.   Fig. 52 *c* shows a cane strip made by folding over a strip a great deal wider than necessary to go round the wire.   Such strips were used for cutting into wallet beads and small amulets.   The mark made by the tool used to press the folded strip together is clearly shown in this specimen.

Folded beads were made in several other ways.   One method was to prepare a slab of glass with a length nearly equal to the circumference of the desired bead, and a width approximately the length of the bead.   This was folded round a rod and the two ends pressed together and fused (fig. 53 *a*).

A slightly different way of making them was to prepare a strip of a similar form, and whilst it was plastic to press a rod through the centre of it perpendicularly to the face, and then bend the two ends of the strip up so as to join together, enclosing the rod between them (fig. 53 *b*).

4. *Double strip beads.*   In this method two strips of glass were taken and

placed on top of each other with a rod between them (fig. 54 *a*). They were then pressed together and cut off at the correct length to form the diameter of the bead, which was finished by rounding it to shape by pressure whilst the glass was still plastic (fig. 54 *b*).

5. *Moulded beads*. These beads were made by taking a piece of plastic glass and pressing it into a mould.

6. *Blown-glass beads*. A small bubble, or a portion of a tube of glass was blown into a bead, either as a smooth ball, or else by blowing it into a mould, as a more complicated or decorative form.

The decoration on a glass bead could be made by making the strips in methods (2) and (3), and the canes in method (4), out of a number of different
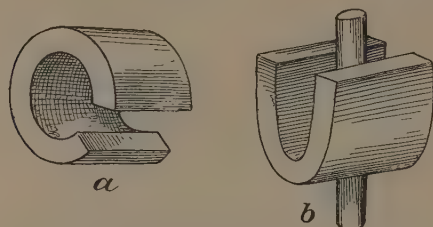
Fig. 53.   Diagram showing method of manufacture of folded beads.
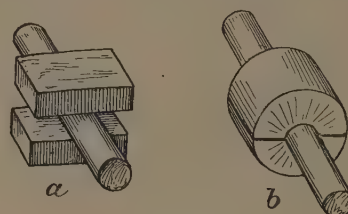
Fig. 54.   Diagram showing method of manufacture of double strip beads.

coloured pieces of glass arranged in long strips, and fusing them together before the bead was made. In these cases the decoration is generally in the form of lines, although circles were sometimes made, due to the folding of the strip. Occasionally elaborate canes with complicated patterns were used. As a decoration, however, other kinds of glass were frequently applied after the matrix had been formed. This was the usual method of making elaborate beads, and an enormous variety of decoration was obtained in this manner.

Two of the most important elements of simple decoration are the spot, and the line. Both of these can be either simple or complex. The Spot is considered first.

Decoration by means of Spots or Eyes.

The *Spot* sometimes was only plain, at other times it was developed into an elaborate figure with numbers of circles round it.

Crumb glass beads. These were made by dusting on small crumbs of differently coloured glass whilst the matrix of the bead was in a plastic condition.

There are two varieties of these, one in which the crumbs are left standing above the surface of the bead. These are called *Raised glass crumb beads* (fig. 55).

In the other form the crumbs were pressed into the matrix of the bead, whilst the bead was still hot (fig. 34 a, A. 2. d). These are called *Impressed glass crumb beads*. In appearance they are sometimes rather similar to the blotched glass beads referred to above.

When crumb beads are referred to without the word glass, it generally means the faience crumb beads which are described later under Faience (see fig. 81).

Eye beads. Most beads in which there are distinct spots, other than crumb beads, are called *Eye beads*. Some of these have plain dots, whilst others have elaborate figures with circles round them.

Fig. 55. Raised glass crumb bead. Cumae, 600 B.C.   Fig. 56. Raised spot eye bead. Glass, Egypt, XVIIIth Dynasty.   Fig. 57. Flush spot eye bead. Glass, Egypt, XVIIIth Dynasty.
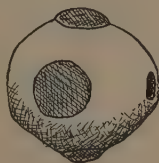
Spot eye beads. These are the simplest form of eye bead. They consist of one or more large spots of coloured glass attached to a matrix of another colour. The spots may have been left standing above the surface of the matrix, in which case they are called *Raised spot eye beads* (fig. 56). Or the spots may have been flattened down to the level of the surface of the matrix, in which case they are called *Flush spot eye beads* (fig. 57).

Impressed ring eye beads. These are the next form as far as simplicity of manufacture goes.

There are two varieties: the usual one has a ring of one coloured glass which has been pressed into a matrix of another colour, the matrix being one of the regular forms. These are called *Impressed ring eye beads* (fig. 58; the portion broken out of the bead shows that the ring is impressed).

In the second variety the matrix of the bead was shaped so as to have horns, and the other coloured ring was impressed into the base of the horn. These are called *Horned impressed ring eye beads* (fig. 59). Occasionally the horns were made of a different glass from the matrix.

Comma beads. These are another variety of impressed bead, in which, instead of complete rings, small open pieces shaped like commas were impressed.

Stratified eye beads. Another way of making eye beads was to superimpose one coloured glass on another. There are two forms: the more usual was

made by impressing a spot of glass of one colour into a different coloured matrix, and then pressing a spot of a different colour into the centre of the first spot, the whole being levelled down to the surface of the original matrix. By this means the different layers of glass became like saucers resting in one another. This process was carried on indefinitely, so that eyes with a great number of rings round them were produced; as many as five were quite common. Beads with eyes made in this way are called *Stratified eye beads* or
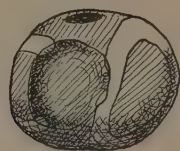
Fig. 58. Impressed ring eye bead. Glass, Mediterranean Area, 800 B.C.
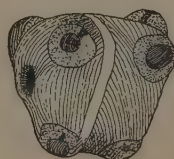
Fig. 59. Horned impressed ring eye bead. Glass, Cumae, 600 B.C.
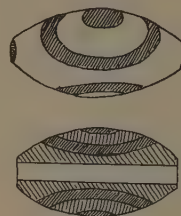
Fig. 60. Stratified eye bead. Glass, Egypt, XVIIIth Dynasty.

Fig. 61. Triangular stratified eye bead. Glass, Cumae, 600 B.C.

Fig. 62. Stratified eye bead, with matrix scarcely showing. Egypt, XXIIIrd Dynasty.
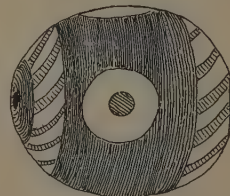
Fig. 63. Eye bead with spiral threads. Egypt, XVIIIth Dynasty.

Flush stratified eye beads (fig. 60), to distinguish them from the horned stratified eye beads described later. They are sometimes triangular (fig. 61).

In one form of flush stratified eye beads, the eyes seem to have been made separately, and then cemented together with a very small amount of matrix, which is scarcely visible in the finished bead (fig. 62).

Horned stratified eye beads. In this variety the horn was made of a series of layers of different coloured glasses. The horns may have been made separately from the matrix, and then brought to the required shape either before or after being attached. Such beads are called *Horned stratified eye beads*.

All the above stratified eye beads may have impressed lines of plain or spirally wound glass threads as well as the eyes (fig. 63).

Spiral eye beads. These were made by several methods. One was to impress a thread of glass into the matrix in the form of a helix (fig. 34 b, A. 10. a and 10. c). Another was to take two glasses and twist them together on the

bead so as to make a spiral (fig. 64), whilst a third way was to form a spiral thread by twisting together threads of different coloured glass, and then applying them as spiral horns to the matrix (fig. 34 b, A. 10. d).

Inserted cane eye beads. To make these beads, glass canes were made, with concentric rings of different coloured glass, and sometimes with other decoration also. The section of these canes was the pattern required for the eye. Pieces were broken off the canes and inserted in the matrix of the bead, so that the section of the cane came on the surface of the bead. Such beads are called

Fig. 64. Eye bead with spiral eyes. Egypt, XVIIIth Dynasty.   Fig. 65. Section of an inserted cane eye bead. Mediterranean Area.   Fig. 66. Cane chevron bead. Glass, Egypt, Roman Period?
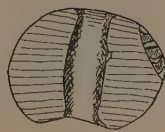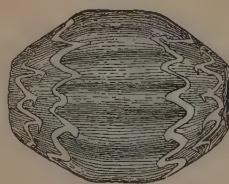
Inserted cane eye beads (fig. 65). Sometimes they were made so that the sections of the cane all touched each other and no matrix was visible (fig. 34 b, A. 9. c). Also, sometimes a piece of cane got at an angle, giving a very distorted effect to the eye.

Decoration by means of Straight Lines.

Next to the Spot the straight line is probably the most important element in the simple decoration of beads.

Cane chevron beads. The case in which the strips or canes of glass used for making beads had patterns in them before they were used, has been referred to above, but the special case, in which the cane had concentric zigzag layers of different coloured glass, must be specially mentioned, as when such canes were cut off and made into beads by grinding down the ends, they formed the well-known *Cane chevron beads* (fig. 66). These are also sometimes called *Sun beads*.

Longitudinally striped beads. These were sometimes made from a cane with lines upon it, at other times by applying threads of a different coloured glass. In the latter case they could be left raised, when they are called *Raised longitudinally striped beads*, or be pressed flat, when they are called *Impressed longitudinally striped beads* (fig. 67).

A special variety of these are the beads which are made from a cane of transparent glass with lines of white or coloured glass either on the surface or in the material. These beads were often twisted so as to give a spiral effect. They are called *Spiral lattice beads*.

Zone beads. Some beads have straight lines running round at right angles to the axis, these become circles and divide the bead into zones. The lines can be either *Raised* or *Impressed*. Such beads are called *Zone beads* (fig. 68).

Glass beads with spiral lines. There are several varieties of these. The spiral can be either *Raised* or *Impressed*, it can have one or more starts, and can be either right- or left-handed (fig. 69).

Impressed helical beads. A special form of disc bead with a spiral impressed on one end is frequently found amongst Saxon beads, and is called an *Impressed*

| Fig. 67. Longitudinally striped bead. | Fig. 68. Zone bead. Glass, Cumae, 700–600 B. C. | Fig. 69. Glass bead with spiral line. Crimea, 400 B. C. |
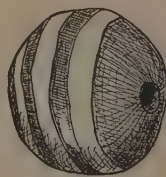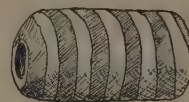
helical bead (fig. 70). These beads were sometimes made by coiling up a small cane of glass which had a narrow strip of another coloured glass along one side of it.

Zigzag beads. Zigzag lines parallel to the axis of a bead were made by winding two canes round a matrix. One cane consisted of two or more different coloured threads of glass twisted into a right-hand spiral, and the other cane was similar but had a left-hand spiral. These two canes were wound round close together for the whole length of the matrix, then the surface was smoothed down, with the result that the whole surface became covered with zigzag lines parallel to the axis. Such beads are called *Impressed zigzag beads* (fig. 71).

Chevron beads. Beads with zigzag lines at right angles to the axis are called *Chevron beads*. One variety, the cane chevron bead, has been described already.

Another method of making them was to wind a thread of glass in circles or spirals round the matrix, then heat it until it was thoroughly plastic, and draw a wire along it, first towards one end of the bead and then towards the other. When this was done at the correct temperature the result was a series of chevrons with approximately straight sides. Such beads are called *Wire-drawn chevron beads* (fig. 72).

Wire-drawn scallop beads. These beads were made in the same manner as the last, but the wire was only drawn towards one end of the bead (fig. 73).

Both these beads and the last can be either *Raised* or *Impressed*.

Wire-drawn ogee beads. These beads were made in the same way as the wire-drawn chevron beads, but the temperature was so arranged that the portion of the band in between the points was very little moved, with the result that a series of ogees was made (fig. 74). These are sometimes called *Feather pattern beads.*

Beads with wavy lines. A thread of glass was often applied to the perimeter
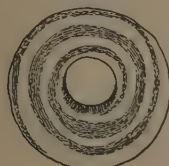
Fig. 70. Impressed helical bead. Anglo-Saxon, glass, A. D. 500.
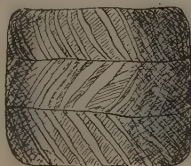
Fig. 71. Zigzag bead. Glass, Anglo-Saxon.

Fig. 72. Wire-drawn or combed chevron bead. Glass, Italy, 300 B. C. ?
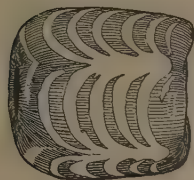
Fig. 73. Scallop bead. Glass, Greek Islands, 300 B. C. ?

Fig. 74. Ogee bead. Glass, Cumae, 500 B. C.
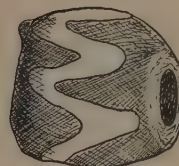
Fig. 75. Single wave bead. Glass, Cumae, 300–150 B. C.

of a bead in the form of a wavy line. There are several varieties of these. They could be either *Raised* or *Impressed.*

Single-wave beads. These are the simplest form. A thread of glass makes a wavy line going once round the bead (fig. 75).

Double-wave beads. These are of two varieties. In one form the two wavy lines go round the bead side by side without crossing; these are called *Adjacent or not-crossed double-wave beads* (fig. 76).

The other form is called *Superimposed or crossed double-wave beads.* In this case the two waves cross one another so as to make a pattern consisting of a series of ellipses (fig. 77).

Wave and spot beads. These beads are similar to the last but have in addition a spot in the centre of each ellipse. The spots are usually of another colour (fig. 78).

Scrabble beads. When a bead has a thread of glass of another colour, which thread has been applied in an entirely irregular manner, it is sometimes called a *Scrabble bead* (fig. 79).

Mosaic glass beads.   Beads with the more elaborate combinations of different kinds of coloured glass are generally called *Mosaic* or *Millefiore beads*.   The latter name, however, strictly speaking should only be applied to those forms in which there are representations of flowers.

Chequer beads.   When beads have a large portion of the surface divided up into squares of different colours, they are called *Chequer beads*.   These
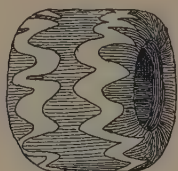
Fig. 76.   Double wave bead. Not crossed. Glass, Anglo-Saxon, 6th century A. D.
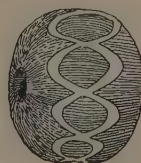
Fig. 77.   Double wave bead. Crossed.   Glass, Cumae, 500–300 B. C.
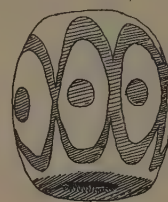
Fig. 78.   Wave and spot bead. Glass, Anglo-Saxon, 600 A.D.

Fig. 79.   Scrabble bead. Glass, Syria, Roman Period.

Fig. 80.   Chequer bead. Glass, Gotland, A. D. 850.

Fig. 81.   Crumb bead.   Faience, Egypt, XIIth Dynasty.

sometimes consist of simple squares; at other times the canes used to make the squares are themselves very elaborately built up, in which case the bead becomes extremely decorative (fig. 80).

The more elaborate forms of mosaic beads are far too numerous to attempt to describe here, but there is one type which has already been figured in group XXXI.   These are called *Glass face beads* (fig. 28; A. 1. b).   In these one of the canes is made up so that the cross-section represents a face.   There are usually several faces on each bead.

Gilt glass beads.   Another form of decoration employed in making glass beads was to put gold leaf into them.   The usual method seems to have been to take a hollow cane of glass and cover it with gold leaf, then add some more glass on the outside, and press or mould it into shape.   In a few cases there does not seem to have been any additional glass added on top of the gold leaf, which was only fused on to the surface.

A different form was made by blowing a hollow bead and then gilding or silvering it by depositing the metal on the inside of the bead.

Enamelled or glazed glass beads. Occasionally glass beads are decorated with thin bands of enamel or glaze over portions of their surface. This may be combined with other forms of decoration, but somewhat the same remarks apply to these beads as to the faience beads, where the question of glaze is discussed more fully.

2. *Frit*

The decoration of frit beads is almost entirely limited to the original colour of the material, and to the shape into which it was made.
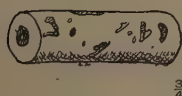
Fig. 82. Splashed glaze bead. Faience, Egypt, XIIth Dynasty.
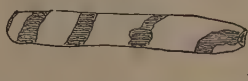
Fig. 83. Faience bead with glazed spiral. Egypt, XVIIIth Dynasty.
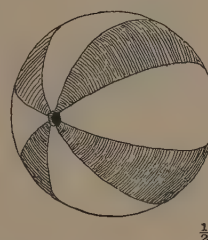
Fig. 84. Sector globe faience bead. Egypt, XIIth Dynasty.

3. *Faience*

There are three principal methods of decorating faience beads:

    a. By sticking on crumbs.
    b. By glazing with different coloured glazes.
    c. By moulding patterns on them.

a. *Crumb beads.* These are made by cementing crumbs of faience into the glaze. Several kinds of regular beads were treated in this manner. This form of decoration was continued for a great time in Egypt, where such beads were made from the Vth to the XVIIIth Dynasty (fig. 81).

b. *Glazing with different coloured enamels or glazes.*

Splashed glaze beads. One of the simplest forms of using glazes of two colours was to splash glaze of one colour on top of glaze of another colour. Beads so treated are called *Splashed glaze beads* (fig. 82).

Glazed spiral faience beads. These beads have a spiral band in a dark glaze painted on to a light coloured long cylindrical or barrel shaped bead (fig. 83).

Glazed zone faience beads. These beads are similar to the last, but they have a series of dark circles painted round the bead, instead of a spiral band.

Sector globe faience beads. These are large spherical beads which are divided into eight sectors. The sectors are usually alternately glazed dark and light blue, or black and blue (fig. 84).

c. *Faience beads with moulded patterns.* There is an enormous number of faience beads in which the pattern is made by moulding.

Ring and dot faience beads. This pattern is moulded on the bead and then glazed. The pattern is also sometimes painted with a darker glaze so as to increase the effect (fig. 34 a, A. 5. b).

Inscribed faience beads. These are faience beads which have inscriptions either moulded on them, or painted on them with a different coloured glaze.

Great numbers of beads of regular forms have amulets either moulded or painted on them. These are best included in the groups to which the amulets belong.

Fig. 85. Painted eye bead. Egypt,
XIXth Dynasty.
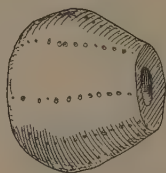
Fig. 86. Pricked pottery bead.
Italy, Etruscan.
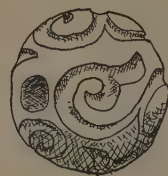
Fig. 87. Carved lacquer bead.
China, 18th century A.D.

A spherical bead, with a uchat painted on it with some form of pigment which has been fired, is shown in fig. 85. This bead belongs to group XXXI, A. 3. c.

4. *China Beads*

There are two main methods of decorating china beads, Underglaze decoration, and Overglaze decoration.

Underglaze decoration. This was the usual form of decorating china beads. The pattern was painted on the bead with a fusible paint; the painting was allowed to dry, and then the bead was glazed all over.

Overglaze decoration. In this case the bead is glazed first, then the decoration is painted on the glaze, and the bead is fired again. This method is uncommon in beads.

The decoration of china beads is usually of a very elaborate nature, often being similar to the decoration on china vases.

5. *Pottery and Clay Beads*

These beads are frequently decorated by moulding, in which case many of the remarks made with reference to faience beads apply.

Pricked decoration. This form of decoration, although occasionally met with in faience beads, is so much more common in pottery ones, that it is

included here. There are two forms, *Irregular pricked beads* in which the pricks are quite irregular, and generally cover the whole surface of the bead (fig. 34 a, A. 3. b), and *Pricked pattern beads* in which a pattern is made by means of pricked holes (fig. 86).

Bucchero beads. These are made of the fine black Etruscan pottery called bucchero nero. Both simple and elaborate beads were made of this.

Gilt pottery and clay beads. These beads were decorated by cementing on to them a layer of gold leaf. This was not at all an uncommon method of decoration.

Pill beads. These are a special form of bead made out of clay, and sun dried. They appear to have been made by rolling a small piece of clay between the finger and the thumb, and then piercing it with a needle. This method sometimes leaves small marks on the surface.

6. *Beads made of Lacquer*

Lacquer beads. This term usually refers to the type which was made by taking a core of wood or papier mâché, and then painting it with a great number of coats of lacquer. If it is wished to separate them definitely from the carved lacquer beads, they can be called the *Painted lacquer beads*.

Carved lacquer beads (fig. 87). These beads have the pattern carved in lacquer. Some of them are solid lacquer, others have a core of some other material, with a thick layer of lacquer round it. A further coat of lacquer is occasionally added after the bead is carved.

These beads are generally of Chinese origin, although they are also found in Japan, whilst the painted lacquer beads are usually Japanese.

In both varieties the decoration is generally of an extremely elaborate nature, but some of the simple forms mentioned above may be found.

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DISCUSSION

Prof. MYRES expressed his indebtedness to the author for a masterly paper which had been illustrated by a beautiful set of examples on the screen. Archaeologists were at a loss when confronted with material of that kind, and modern excavators had felt the difficulties due to a want of method, but the ideal method, if it could be adopted, would be ruinously expensive. Beads had an enormous variety with subtle differences in technique which made them especially useful for dating. He had, when excavating in Cyprus, found beads in every tomb, but it was difficult to use the evidence, as the subject as a whole had been neglected, though certain classes had attracted undue attention. The author had complicated the scheme in a tantalizing manner by including pendants, which were above all difficult to define. Another point that challenged discussion was the place of manufacture; but apart from such debatable matters, a fixed classification and nomenclature of beads would be a boon to archaeologists.

Sir HERBERT JACKSON said it was interesting to note that while the Egyptians were familiar with the beautiful red beads made from cuprous oxide, the Saxons could make orange yellow beads from the same oxide. These often contained red portions. He esteemed it a privilege to have been of assistance to the author by chemical researches; and believed that beads would throw light on many vexed questions in history.

Sir MARTIN CONWAY thought that discussion could add little to the paper, and welcomed a scheme of classification for what he had been collecting in the form of illustrations for many years. The author had left off where his own interest began—in the Anglo-Saxon and the Merovingian periods; and the multitude of types in Europe involved many problems. A chronology was needed even more than a classification, but the former was complicated by the survival of beads through many generations. He thought the Aggri beads were earlier than the Egypto-Roman period to which they were often assigned: they had been seen in wear recently in the Sudan, and might be 2,000 years old.

Dr. H. R. HALL thought the Society had not had such an interesting archaeological paper for a long time: the illustrations had been specially instructive. With Mr. Beck's assistance he had re-classified the beads in his Department of the British Museum, and found that collectors of former days had been careless in stringing them, specimens of different dates and origins being often associated. Mention had been made of a piece of glass found by himself, not at El Obeid but at Abu Shahrein in Mesopotamia: it dated before the time of Bursin of the third dynasty of Ur. Unexpected materials were used for beads at various periods. He had found granulated beads, blue on blue, at Deir el Bahri; others were made of straw, and the scarab was sometimes a bead, sometimes a seal.

Mr. REGINALD SMITH inquired more particularly about the centres of origin, and asked if any types could be regarded as native to Britain. The segmented bead found in Bronze Age burials both in England and Scotland had been compared with Egyptian specimens of the XVIIIth dynasty; but there was some reason to regard them as home-made, and in any case it was difficult to account for their distribution. Chevron beads again could be seen in many museums of Britain, but there seemed to be no case of association with datable objects. A paper such as Mr. Beck's cried out for ample illustration in colour, but reproduction on that scale was expensive, and had been seldom undertaken by the Society, for example, Miss Layard's Anglo-Saxon necklaces from Ipswich in *Archaeologia*, lx. Beads were evidently plentiful in classical and post-classical times, but he could not call to mind many medieval specimens and it was only recently that they had again become fashionable. Their small size, durable material, and portability all added to the difficulty of tracing them to their homes and giving even limiting dates to their manufacture. He felt that Mr. Beck's first paper as a Fellow of the Society had been a great success.

The PRESIDENT returned thanks on behalf of the Society for a paper on what had rightly been called a fascinating subject. The universality of beads was remarkable, and indicated the value of beads as well as the immutability of sex. To judge from pictures beads were not uncommon in the middle ages, and ornaments of that kind had a very human interest, as they were connected with many incidents in life. Mr. Beck had done a service in showing that beads carried with them a lesson in science and history, and he hoped the matter would be followed up in another paper.

Mr. BECK replied that there were some beads of the thirteenth or fourteenth century in the Guildhall Museum, and referred to the large triptych in the Salting collection. He had not dealt with dates in the paper which was mainly concerned with classification, with a few hints as to methods of manufacture. He had endeavoured to fix several hundred technical terms, and thought that many difficulties would disappear under the microscope, which revealed differences in material invisible to the naked eye. Alleged similarities might in that way be put to a crucial test.

II.—*Early Chessmen of Whale's Bone excavated in Dorset.*
By O. M. DALTON, *Esq., F.S.A.*

THE very interesting chessmen illustrated on pls. v and vi were found during excavations carried out by Mrs. McGeagh at Witchampton Manor about five miles NNW. of Wimborne. The work revealed the foundations of buildings regarded as mainly of medieval origin, though a British fibula and a quantity of Roman pottery, chiefly in fragments, have also come to light.

The chessmen, which represent more than one set, were found in different places: in a corner of the oblong building lying apart from the main group towards the river, and outside this building on the same side. Those discovered within the building apparently lay on the floor; near them were a small gold ring of the so-called stirrup form set with a red stone, and a bronze stirrup, both dating from the latter part of the twelfth century. All the chessmen are carved from bones of a whale's flipper, but whereas in the case of those found within the building, the bone is of its natural colour, those from outside have been purposely blackened by the action of fire in order to distinguish them from the uncoloured men. These white pieces, which are in more or less perfect condition, represent a 'bishop' (pls. v, fig. 1, and vi, fig. 1) and two knights (pl. vi, fig. 2), a pawn (pl. vi, fig. 3) being less complete, but sufficiently preserved to be unmistakable; in addition, there are uncoloured fragments. The blackened examples are imperfect; one forms the greater part of a principal piece, perhaps a king; another is clearly a fragment of a pawn. But the most interesting representatives of this group are two fragments of major pieces [1] inscribed with large and deeply incised capital letters, apparently an unprecedented feature (pl. v, fig. 2).[2]

The Witchamptom chessmen are very large and heavy. The 'bishop', which is the most massive even now in its desiccated condition, weighs between ten and eleven ounces, and stands 4·2 in. high. The pieces are not 'naturalistic', but reproduce in a barbaric way the schematic forms adopted by the Arabs when they received the game from India. With the Hindus, chess was a war-

[1] The larger of the two is itself composed of two fragments which undoubtedly belong together.
[2] The large Indian 'King' in the Bibliothèque Nationale at Paris is inscribed on the base with the maker's name in Cufic characters, but the inscription is inconspicuous and the piece much later. For this King see A. Goldschmidt, *Die Elfenbeinskulpturen aus der romanischen Zeit*, vol. iv (Berlin, 1926), fig. 6 on p. 5; H. J. R. Murray, *A History of Chess* (Oxford, 1913), p. 87.

game, and the men represented in a realistic manner the leaders of the host and the different arms of which it was composed. The king, as commander-in-chief, rode an elephant, as did his vizier or counsellor, who acted as second in command. The division of war-chariots was represented by a single example, in
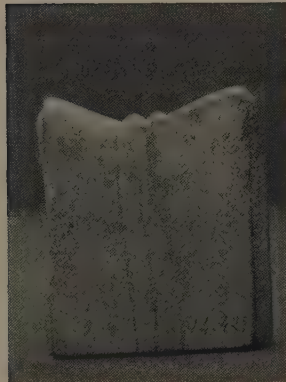
Fig. 1. Chessmen in the Musée de Cluny.

which the horses, the driver, and the fighting man were copied from the life. In the same way, an elephant stood for the elephant-corps, a horseman for the cavalry, and a single foot-soldier for the infantry. The Arabs, objecting to naturalistic treatment for religious reasons, adopted a severely conventional form for each class. These forms, as Professor Goldschmidt has shown,[1] were based on the general contour seen from the standpoint which yielded the most characteristic view. The king and the vizier each rode on his elephant in a howdah, in front of which sat the *mahout*. Both these pieces were conven-

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[1] A. Goldschmidt, as above, pp. 4-8.
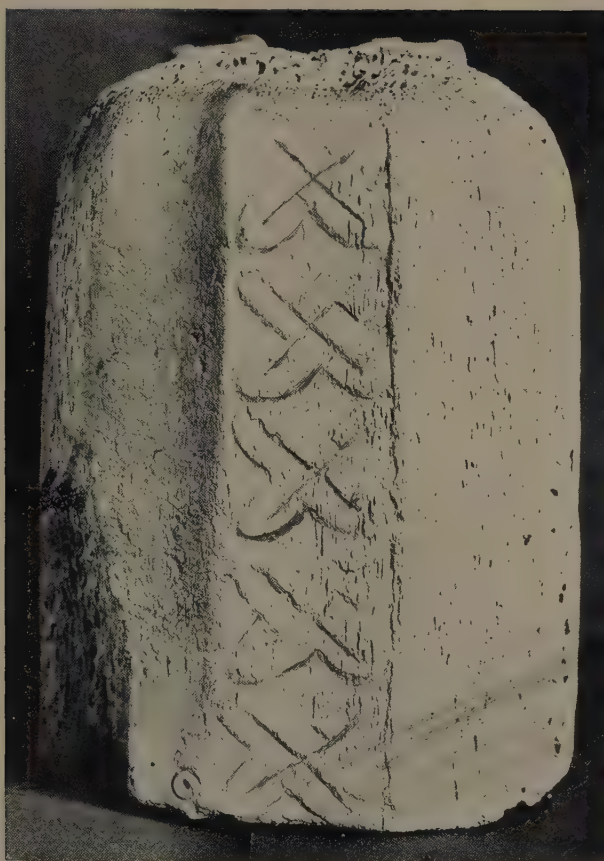
Fig. 1. Bishop, back view, Witchampton ($\frac{1}{1}$)
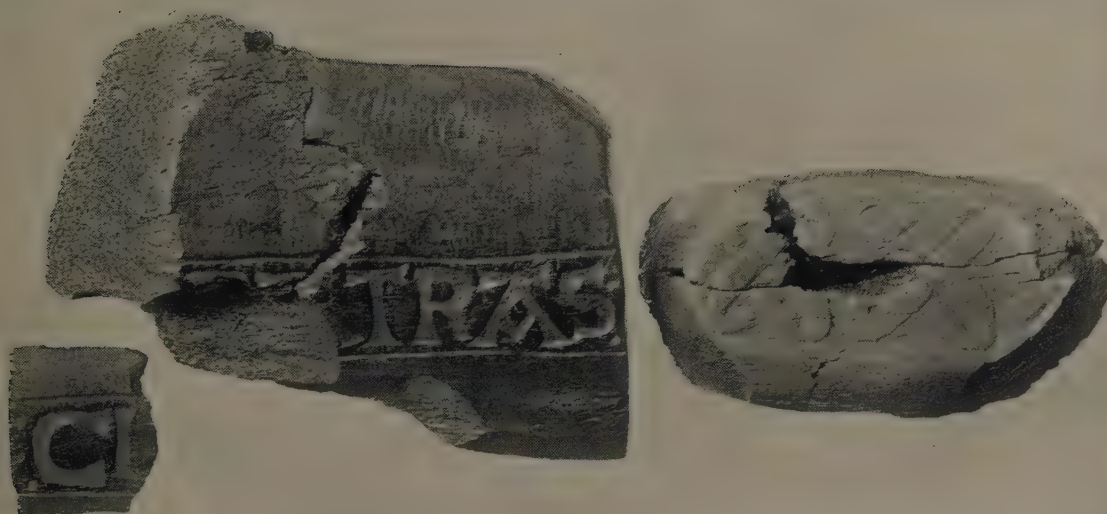
Fig. 2. Fragments of chessmen, Witchampton ($\frac{1}{1}$)

Fig 2 Knight, Witchampton (½)

Fig. 3. Pawn, Witchampton (½)

Fig. 1. Bishop, Witchampton (½)

tionalized down to mere shaped blocks of the form shown in fig. 2 *a*, where the highest part represents the howdah, the rounded lower part the elephant's head, the knob-like projection, or narrow ridge on the top, the *mahout* and the royal rider. The king and the vizier, seen in this form, are distinguished only by their size, the vizier being the smaller of the two. The chariot and its horses viewed from the side, appear as a block with a wide V-shaped depression between two high points, one apex representing the heads of the horses, the other the head of the driver (cf. fig. 1 *c*). The form representing the typical
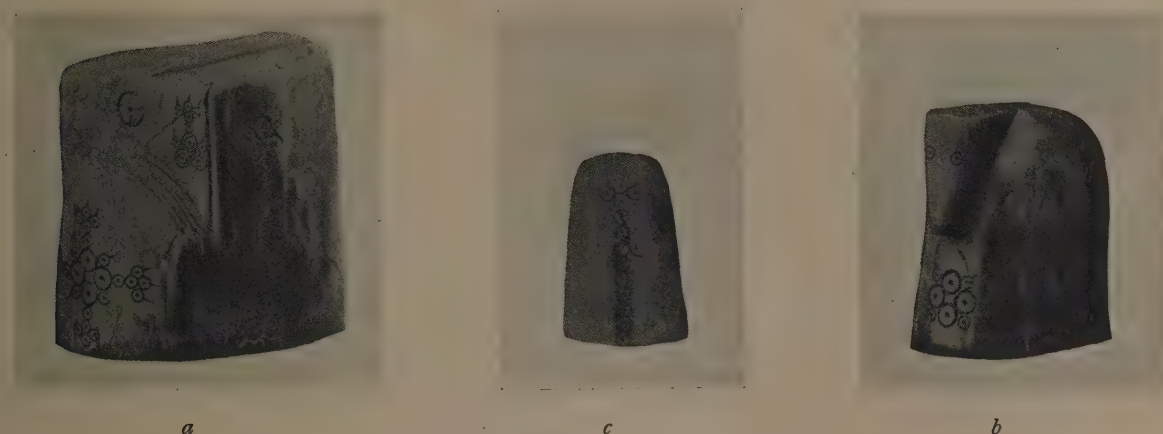
Fig. 2. Chessmen found in Normandy.

fighting-elephant was rounded at the top, but had two projections side by side, intended either to depict the driver and a fighting man, or the two tusks of the beast. The cavalryman received a similar form, but with only one projection; the foot-soldier was a plain cylinder rounded off at the top. It is well known that the pieces of our modern chess descend from those of the Arab game, and that although, as in the case of the knight, there has been some reaction towards realism, a conventional treatment is still retained. The vizier was displaced by the queen; the charioteer became the warder or castle; the elephant was transformed into the bishop; the horseman was specialized into the knight; the foot-soldier, as *pion* or pawn, from first to last preserved his character almost unchanged.[1]

Though the principal Witchampton pieces follow the Arab types and can be recognized as a bishop and two knights, the conversion of the projections into animals' heads is neither an Arab nor a south European feature. It points rather to the north, to the Viking and Anglo-Saxon area, as does the band of

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[1] All these developments are explained in Mr. H. J. R. Murray's *History of Chess*, already cited, a book indispensable to those interested in the subject.

ornament on the bishop's back, consisting of a series of 'links' which cross each other diagonally and interlace. A similar zoomorphic treatment of the projections occurs on one of the bone pieces in the Musée de Cluny at Paris, found near Châtenois in the Vosges, and regarded as dating from the eleventh century (fig. 1 *d*).[1] A unit of design like those composing the band of ornament is seen on the back of a queen in the series of twelfth-century chessmen from Lewis, now at Edinburgh.[2] The motive, however, is more ancient; it is seen on a stone cross of much earlier date from Ellerburn in the North Riding of Yorkshire,[3] and must have been of common occurrence in England, as it was in Norway. The longitudinal faceting of the pawns appears to be likewise a northern feature, which again recalls the men from Lewis. The polygonal shape was perhaps adopted to prevent the pieces from rolling.

From the historical point of view the most interesting objects in the find are not the perfect pieces but the inscribed fragments (pl. v, fig. 2). Two of these, fitting together and forming the greater part of a large piece, perhaps a king, give a series of six letters, of which the last four are undamaged. The second is very imperfect, but can be identified with practical certainty; the first is represented by a very small portion, and its complete form can only be inferred. The conjecture which appears most probable is that this first letter was an angular ꙅ, and if it is correct, the word before us is SATRAS. If the style of the lettering could be dated within narrow limits, it would determine the age of the chessmen. Unfortunately the evidence is not sufficiently precise to yield a certain result. The forms have all the appearance of being very early; in combination they have the feeling and character of Anglo-Saxon inscriptions of the period between the seventh and eleventh centuries. All the letters are familiar members of the Hiberno-Saxon alphabet, which retained its character through the ninth and tenth centuries, but lost individuality in the eleventh, and was then succeeded by the Romanesque alphabet of Norman times. The ᚪ with heavy cross-bar at the top, internal chevron, and legs expanding rapidly towards the feet, a popular Hiberno-Saxon form, is freely found in MSS., and on Anglo-Saxon stone and metal-work.[4] As far as MSS. go, the perfect type would appear to have already become a rarity in the eleventh century. From the tenth century, a straight or slanting cross-bar usually replaces the internal chevron; the cross-

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[1] The photograph and measurements have been kindly supplied by our Hon. Fellow M. Jean J. Marquet de Vasselot, of the Museum of the Louvre. The Châtenois pieces are small, the largest only measuring two inches in height. A single zoomorphic projection occurs on a 'knight' found in Normandy, recently in private possession in that province.

[2] Goldschmidt, as above, pl. LXIX, no. 232 *b*.

[3] W. G. Collingwood, F.S.A., 'Anglian and Anglo-Danish Sculpture in the West Riding', *Yorkshire Arch. Journal*, xxiii, p. 255.

[4] Lindisfarne Gospels, Ruthwell Cross, Hartlepool 'pillow-stones', gold ring of Buredruth, etc.

bar at the top now has one half lopped off. In stone inscriptions[1] the full type survives longer, but it degenerates. Though it is seen on the dedication stone at Kirkdale, dated A.D. 1064,[2] it is far from its early perfection, which is more nearly reproduced on the Hartlepool stone now at Newcastle,[3] on the eighth-century Anglian cross-shaft from Lancaster,[4] and on the carved and inscribed stone from Wensley,[5] Yorkshire. Intermediate forms are found on the early sun-dial at Byland, Yorks,[6] on a stone at Littleton Drew, Wilts,[7] and on a cross-stone at Trevena, Cornwall.[8] The well-straddled letter with legs meeting under a massive upper cross-bar and expanding markedly downward, passes into a narrower form with less conspicuous upper cross-bar, the legs being more even in breadth throughout, and not in contact at the top. In minor works of Anglo-Saxon art the fully characterized $\overline{\mathbb{A}}$ is seen in several examples, for instance, on the gold rings inscribed with the names Aethred and Buredruth in the British Museum, the first dating from about A.D. 900, the second probably not much later. The several characteristics may all be retained into the eleventh century, but as on inscribed stones there is degeneration. On coins, the full type, which occurs in earlier reigns, stops suddenly at the reign of Edward the Elder, not to reappear until the time of Edward III. Another letter, the form of which may have importance, is the R. The lower limb is abbreviated, stopping short of the base level. It may be urged that this was done for economy of space, and this may have been the case. But it is worthy of remark that this particular feature is of not infrequent occurrence in Anglo-Saxon monuments. It is found, for example, in the Lindisfarne Gospels, on Hartlepool pillar-stones, on the dial at Wensley, and on the ring with the name Buredruth, so often, in short, as to weaken the argument based upon economy of space. Some significance may further be attached to the fact that the pairs of dots at the end of a word, so conspicuous on the chessmen, are similarly placed on the ring of Aethred.

The epigraphical evidence, as far as it goes, seems consistent with an Anglo-Saxon date, and even with so early a period as the tenth century. But it yields probability, not proof. The obstacle to its complete acceptance lies in inconvenient facts of survival in the case of well-marked types. Thus I have been reminded[9] that an example of the $\overline{\mathbb{A}}$, with all its salient features, occurs on the first great seal of Richard I, made in 1189. It may prove that other letters,

[1] These are conveniently brought together in the Romilly Allen MSS. in the British Museum, vol. xlii (Inscribed Stones, England), Add. MS. 37580. The volume contains cuttings from archaeological papers, and various illustrations, references being given.

[2] Romilly Allen Coll., as above, no. 745.

[3] *Ibid.*, nos. 587 ff.   [4] *Ibid.*, no. 594.   [5] *Ibid.*, no. 642.

[6] *Ibid.*, no. 738.   [7] *Ibid.*, no. 616.   [8] *Ibid.*, no. 578.

[9] By Mr. H. S. Kingsford.

including the R, have parallels equally close at a similar time. The strength of the epigraphical argument for the earlier date lies in the 'feeling' of the group of letters forming the word SATRAS. It has an Anglo-Saxon character; its affinity with Norman and Plantagenet inscriptions is much less marked. The epigraphy does not enable us to prove the case by logic; but it leaves us with a general impression.[1]

The letters of the word assumed to be SATRAS giving an indication rather than certain guidance, it is pertinent to ask whether its meaning can help our inquiry. The first impulse is to see in it a proper name, that of the maker or of the owner, or that of the piece itself. But it is not easy to suggest a proper name of this description either Anglo-Saxon, Viking, or Norman-French; the last syllable, indeed, has an oriental sound. Nor do the early names of any pieces, though these were all oriental, appear to contain the two syllables of *satras*. On the other hand, the word does bring to mind the earliest name for the game of chess, which western Europe adopted from the Arabs, the Arabs from the Persians, and the Persians from the Hindus. The Hindu original was *chaturanga*, meaning 'the four members', i. e. the four constituents of an Indian army mentioned above, i. e. chariots, elephants, horse and foot. The Persian corruption, as we learn from a Byzantine writer,[2] was σαντράτζ or a word of similar sound, which the Arabs in their turn corrupted into *shatranj*, prefixing the definite article, so that their full name was *ash-shatranj*. Among the Christian Spaniards, *ash-shatranj* became *ajedrez* (formerly pronounced *ashedrés*, now *ákhedréth*), among the Portuguese *xadrés* (pronounced *shedrés*).[3] Either *shadres* or *santratz*, which by metathesis might easily become *satrantz*, might be corrupted into *Satras*; degradations of oriental words, at least as remote as this from their originals, are of no uncommon occurrence. But if the word on our chessman is derived from either of these two forms, it would equally supply an argument in favour of the earlier, rather than the later, of the two dates suggested for the chessmen. For in the early years of the eleventh century, when documentary evidence with regard to chess in western Europe begins, the word *scachus* or *scacus* [4] and its variants had already been adopted. It was henceforward the only term employed outside Spain; the derivatives of *chatu-*

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[1] A suggestion of early date is given by the small circle with a central dot seen at the bottom of the band of ornament on the back of the 'bishop' (pl. v, fig. 1). Though such circles may occur at any period, they were especially popular in England before the twelfth century, and are common on the bone draughtsmen and chessmen ascribed to the eleventh.

[2] Murray, *Hist. of Chess*, p. 167. Ducas, whose History dates from about A. D. 1400, is a late authority; but it may fairly be assumed that the σαντράτζ of his time descended from a word similar in sound, representing the earliest Persian version of the Hindu term.

[3] Murray, p. 395.

[4] The word *scac* was a corruption of the Persian Shāh (= king).

ranga do not occur in the medieval documents of France, Germany, England, or Scandinavia. If, then, the *satras* on the Witchampton piece is a derivative of *chaturanga*, this is a point in favour of the tenth, rather than the twelfth century.

But on this supposition how should we account for its use on objects so northern in type as those with which we are concerned? Two alternative explanations present themselves. *Satras* might be a corruption of the Spanish *shedrés*, which passes north either by land through the France of the later Carolingian period, or by sea, carried by the Vikings after their great expeditions in the west Mediterranean in the ninth century, when they raided both Spain and the south of France, visiting Lisbon, Cadiz, Cordova, and Seville, and advancing up the Rhone as far as Valence. Or it might be a degradation of *santratz* (or *satrantz*), carried to the north, with chessmen of oriental origin, by the Swedish merchant-adventurers who, in the early middle ages, traded with the East across Russia, and disposed of their goods to traders of the Baltic and the North Sea. The importance of Scandinavian trade with parts of the Byzantine Empire, Mesopotamia and Persia, has long attracted the attention of scholars, whose researches have revealed the existence of extensive commercial activity, the period of greatest prosperity lasting for more than a hundred years from about A.D. 875 to the beginning of the eleventh century.[1] In Russia there were numerous Scandinavian settlements on the great rivers, especially on the Volga and the Dnieper; while Arabs from their side came certainly to Kiev, and probably as far as Bulgâr (Bolgary, in Kazan). Thus Swedes and Arabs met in Kiev, from which place there was easy access to the Black Sea and Constantinople. At Iltid (Astrakhan) at the mouth of the Volga, they obtained oriental goods from the Khazars, who controlled the country about the northern Caspian; but traders from the north are said themselves to have penetrated to Bokhara, and to have reached Baghdad. At its northern end this trade route passed Ladoga and Novgorod to the main clearing-house in the island of Gotland, which maintained regular relations with Truso, near Elbing, and Jumneta in Slesvig. There is record of visits to these places by Anglo-Saxons, and it may be noted that Anglo-Saxon coins have been discovered in Gestrikland (Sweden), and brooches suggesting Anglo-Saxon origin have come to light in Esthonia and in the Russian Government at Pskov. The volume of this Scandinavian commerce with the East may be measured by the vast numbers

[1] G. Jacob, *Der Nordisch-baltische Handel der Araber im Mittelalter*, Leipzig, 1887, and *Der Einfluss des Morgenlands auf das Abendland, vornehmlich während des Mittelalters*, Hanover, 1924; T. J. Arne, *La Suède et l'Orient* (vol. viii of *Archives d'études orientales*, published by J. A. Lundell), Upsala, 1914; see also the references given in *Cambridge Mediaeval History*, iii, p. 624, section 6, and for general facts B. Pares, *A History of Russia*, 1926, pp. 17 ff.

of Arab silver coins discovered along its routes and in the Baltic countries. The importation of coins ceased with the early eleventh century through a shortage of silver in the East, but some trade probably continued, and there was a resumption on a greater scale in the twelfth century. If a knowledge of chess travelled by this route, the general evidence suggests that it would be more likely to have done so before than after the eleventh century. It might be argued that the word *santratz* could have passed this way even after the revival of the twelfth century ; but if so some trace of it ought to appear in early Scandinavian literature.

If further evidence should enable us to prove that these chessmen date from the tenth century, where are we to suppose them to have been made ? They may have been imported from northern England, but there is no reason why they should not have been produced in the south, perhaps in the very county in which they have been discovered. The south of England was at that time very accessible to continental influence, and a knowledge of chess may well have entered the country at that point. Conditions were not unfavourable to its introduction. In the first half of the century the French kings had established a *modus vivendi* with the Vikings settled in Normandy, while Charles the Simple married a daughter of Athelstan, son of Edward the Elder. It is Mr. Murray's opinion that although documentary evidence is lacking for the knowledge of chess in Europe outside Spain before the early eleventh century, yet philological evidence suggests a period at least a century earlier.[1] Fresh archaeological discovery may one day show that the stories in the twelfth-century *Ramsey Chronicle* and in the *Lestorie des Engles* of Gaimar, however legendary in themselves, may yet be based upon authentic tradition ; it will be remembered that Gaimar represents Ordgar as playing chess in the reign of Edgar (d. A.D. 975), and the *Chronicle* describes Cnut as similarly engaged.[2]

The examination of the Witchampton chessmen leaves us confronted with many difficulties. Alternative dates are suggested ; we have to deal either with the twelfth century or with an earlier period, perhaps as remote as the tenth. Supporters of the later date have a certain advantage over those who incline to the earlier. They can point out that the pieces were apparently found on the same floor level as two twelfth-century objects, the ring and the stirrup, and that the conventional ornament on the bishop and the shape of the pawns both find analogies on the Lewis chessmen, which are also of the twelfth century.

[1] *History of Chess,* p. 402.

[2] Mr. Murray thinks that Cnut *may* have played chess at Rome in 1027 and after his return (pp. 420, 443), but that better evidence for the playing of chess in pre-Norman times may be found in the names used for the bishop in the ' Winchester poem ' in the Bodleian (early twelfth century) and in Alexander Neckam's *De naturis Rerum,* ch. 184, *De scaccis* ; these names (*calvus, senex*) suggest early Italian and German parallels.

They can show that such a characteristic form as the ⋏ of the inscription occurs on a twelfth-century seal, and challenge those who differ from them to prove that forms of the other letters did not equally survive to that time. The arguments on the other side are less positively supported. Those who use them are forced to make certain preliminary admissions. They cannot pronounce it altogether probable that a later medieval family should have preserved and treasured chessmen two centuries old, though they may urge the possibility that there were heirlooms in those days. On the other hand they have drawn attention to certain features in favour of their contention. They have pointed out the likeness of the animal-head projections to those on pieces of a more finished style now in France, pieces attributed to the eleventh century, and ornamented with the early concentric circles of which an example is seen on the 'bishop's' back. They have shown that the ornament of 'crossed-links' is not peculiar to the twelfth century, but occurs on sculptured stones as early as the ninth.[1] They can suggest that the faceting of the pawns is an obvious device to prevent them from rolling, and may well have been old when adopted by the makers of the Lewis sets. They can base a further argument on the fundamental difference in character and feeling between the elaborate treatment of the Lewis pieces, realistic throughout in the representation of human types, costume, and weapons, and the bare schematic style of those from Witchampton. They may admit that primitive appearance is in itself no criterion, but can yet urge that the manufacture of these rude objects in the material chiefly associated with an earlier time[2] would be somewhat remarkable in an age abundantly supplied, as was the eleventh century, with the morse ivory so much more suitable for carving than the coarse-grained cetacean bone. They may freely grant that in outlying districts, such as the west of Scotland, survivals of remarkable persistence do occur. But they will maintain that Wessex was not an outlying district; it was the most civilized part of England, and would be expected to receive the latest developments with less delay than other places. They will deem it improbable that at the very time when the remote island of Lewis received sets of admirable finish, carved in the finer material and of a size fitted for use upon boards of moderate size, rich persons living in Wessex would acquire these plain and

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[1] It is of course well known that in representations of chess players in mediaeval MSS. schematic pieces are the rule. But these pieces are clearly small, as they are used on boards of ordinary size, and the schematization is less crude than that with which we are concerned. It may also be the case that there was a convention in the painting of chessmen, formal types being far easier to depict on a minute scale than realistic; it is remarkable that the medieval chessmen which have come down to us in the West are almost all naturalistic in treatment.

[2] Whale's bone was occasionally used in later times when a large flat surface was required. But as a general rule its employment suggests an earlier date than the twelfth century, at which period the supply of morse ivory, a far finer material, was abundant.

somewhat clumsy men, which can only have been used on the surface of a large table, or even upon the floor.   In their judgement such an hypothesis places a strain upon the imagination. With regard to the inscription, they will concede that the reading SATRAS is not certain, and that the arguments based upon it lose all value if it is overthrown.   But it has probability, and as long as it holds its own these arguments tell in favour of the earlier date. Finally, they will say that whatever individual types of letters may have survived into the Middle Ages, the feeling and character of the combination forming the word SATRAS strike them as having the style and spirit of Anglo-Saxon inscriptions.

After being on loan for some months, all the pieces were generously given to the British Museum by Mrs. McGeagh in April, 1927 (see *British Museum Quarterly*, i, 90).

III.—*Recent Archaeological Research in Scotland.* *By* J. Graham Callander, *F.S.A. Scot., Director of the National Museum of Antiquities of Scotland.*

Read 31st March 1927

In this communication, which is submitted in response to the invitation sent by your President to the Council of the Society of Antiquaries of Scotland asking them to nominate one of their Fellows to report on recent archaeological research in Scotland, I propose briefly to review the recent discoveries and developments that have taken place in our endeavours to unravel the story of prehistoric and later man in Scotland. I shall begin at the earlier periods, and, working forward, indicate the progress we have made, the problems we see before us, and the manner in which we have dealt with the various questions as they arose.

Until very recently, it has generally been accepted, almost as an axiom, that the earliest remains of man which were to be found in Scotland dated only from the Neolithic period. It was believed that evidence of the occupation of the country in earlier times need not be looked for, as the moving ice of the various glacial periods would have swept away any traces of human occupation formed in the less rigorous inter-glacial times, when man might have ventured into the northern part of our island. Bones of the mammoth, however, had been found in different parts of the country,[1] and, on the assumption that man could have existed under the same conditions as this animal, the possibility of the discovery of palaeolithic remains north of the Tweed had always to be kept in view. The discovery of harpoons of Azilian type in the neighbourhood of Oban, and in other parts of Argyll, seemed to indicate the presence of a pre-neolithic population (pl. vii, fig. 2). This conclusion, however, was contested by one of our most eminent geologists,[2] who argued that, as what he considered neolithic canoes had been found in the 50-ft. raised beaches in the Clyde and Tay valleys, the so-called Azilian relics, having been deposited while the 25–30-ft. raised beach of a later age was being formed, could not be assigned to pre-neolithic times. A feeling of uncertainty regarding the period of the harpoons prevailed until six years ago, when the Abbé Breuil, having had an opportunity of handling many of the relics, pronounced them undoubtedly to belong to the Mas d'Azil-Tardenois stages of culture.[3] This conclusion was arrived at, not only because

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[1] Some of these bones are much glaciated, and may have been carried very far by the ice.
[2] James Geikie, *Antiquity of Man in Europe*, pp. 274 and 315.
[3] Breuil, *Proceedings Soc. Ant. Scot.*, vol. lvi, p. 261.

of the form of the harpoons and the associated flints, but because of the presence of a characteristic Tardenoisian beaked micro-graver amongst a collection of flints found in the 25–30-ft. raised beach at Campbeltown, and of another found with highly patinated flints on ploughed land on the same beach near Stranraer, in Wigtownshire.

But this does not exhaust the evidence which has been forthcoming to prove the occupation of parts of Scotland by a people in this stage of culture.

Fig. 1.   Pygmy implements found near Dryburgh.   ($\frac{1}{1}$)

A good many years ago, the discovery of pygmy flint implements near Banchory, on Deeside, was reported, and since then a few have been found near Irvine, in Ayrshire, and considerable numbers near Dryburgh, in Berwickshire (figs. 1–4).[1] The last site has produced many examples of triangles, crescents, notched implements, small scrapers, and other implements, which are strongly reminiscent of some of the collections from Tardenoisian sites in England. Now that such relics are known to exist in different parts of the country, we may expect to hear of further discoveries in other localities.

While an important advance has been made in establishing the claim that pre-neolithic man existed in Scotland, it is hoped that certain discoveries made last summer in a cave near Inchnadamph, Sutherland, may be the forerunners of others which will permit of the pre-history of Scotland being put back to true palaeolithic times.

The cave which was excavated by Mr. James E. Cree, Dr. Ritchie, and

[1] Callander, *Proc. Soc. Ant. Scot.*, vol. lxi, p. 318.

Fig. 2. Pygmy implements found near Dryburgh. ($\frac{1}{1}$)

Fig. 3. Pygmy implements found near Dryburgh. ($\frac{1}{1}$)

myself, is one of four lying in a limestone cliff, at an elevation of 1,000 ft. above sea-level, near the head of a remote glen down which runs the Allt nan Uamh, or Burn of the Caves, the mouths of the caverns being about 200 ft. above the bed of the burn. One of the caves, the second from the east, was excavated thirty-eight years ago, and it was then found that the floor consisted of six layers.[1] In two of these—the third from the top, which consisted of cave-earth,
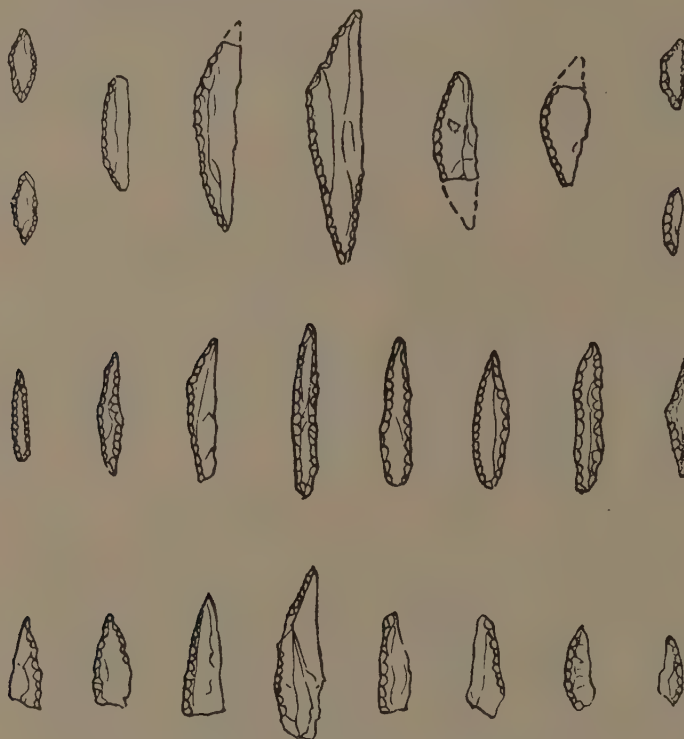
Fig. 4. Pygmy implements found near Dryburgh. ($\frac{1}{1}$)

and the fifth, which was composed of limestone fragments—a considerable number of animal and other remains was discovered, the upper layer yielding, amongst other bones, remains of reindeer, red deer, and northern lynx, and the lower, remains of brown bear, lemming, and probably reindeer and red deer. No implements were found in either of these layers, but hearths, indicating the presence of man, were discovered in the higher one. The excavators considered that they were working in a deposit of neolithic times. In the adjoining cave on the west, we found a series of layers, the second from the top formed of cave-earth, and the third of slightly rolled gravel containing many limestone fragments. In the cave-earth were found, amongst other bones, those of red deer and bear, a human skull and several other bones definitely interred, and the

[1] Peach and Horne, *Proc. Roy. Soc. Edinburgh*, vol. xxxvii, p. 338.
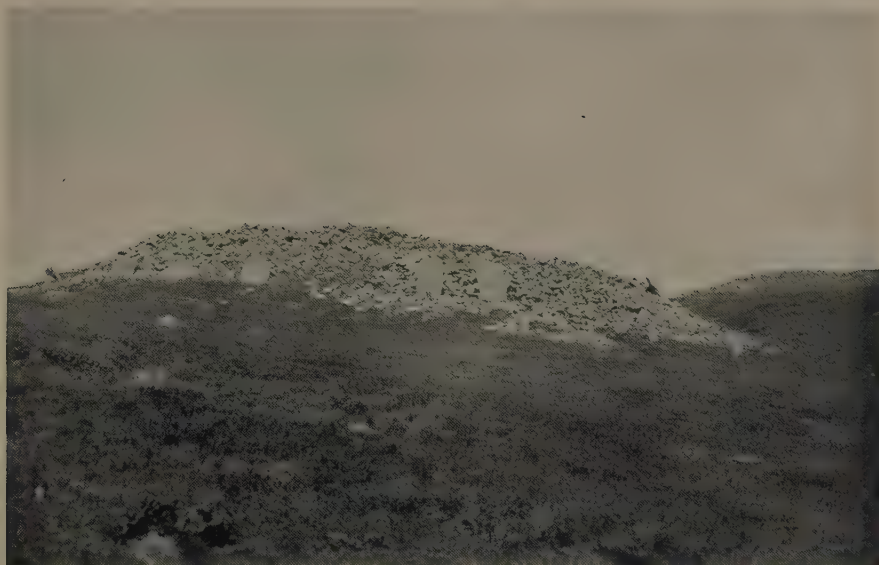
Fig. 1. Chambered cairn, Dun Bharpa, Barra

Fig. 2. Azilian harpoons from Oban and other parts of Argyll

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Fig. 1. View of chambers in segmented chambered cairn,
Sliddery Water, Arran

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Fig. 2. Plan of segmented chambered cairn at Drannandow, Kirkcudbright

remains of another skeleton in a heap at the back of the cave. In addition, there were found two bone objects, one roughly pointed, and the other a stout, well-fossilized, pin-like object, which had had two perforations in the head, one being broken off. In the next layer, amongst the slightly rolled gravel, we got over eight hundred burrs of shed antlers of young reindeer, very highly fossilized, bear's teeth, and occasional small fragments of charcoal. Some of the antlers showed slight cuts made by man. Only one human artifact—a small tapered implement of reindeer horn—was found in this deposit. This layer seems to have been laid down when the surface of a glacier outside was about the level of the mouth of the cave, so that the water from it on running inwards escaped down a shaft at the back. At a depth of 10 ft. the shaft, which was here plugged with a block of rock that had fallen from the roof, gave access through a rising tunnel to an inner cave, over 90 ft. long. The inner cave was filled to within 18 ins. of the roof with silt that seemed to have been brought in by water from the inner end, the water escaping down the shaft already mentioned. Amongst the bones found in this silt, remains of the cave bear and arctic fox have already been identified by Dr. Ritchie. The reindeer bones were seen by the Abbé Breuil in the late autumn, while passing through Edinburgh, and he had no hesitation in saying that they belonged to Magdalenian, or, possibly, earlier times. Unfortunately, no implements or tools typical of a period were discovered.[1] Subsequent to the reading of this paper excavations carried out in the cave partially explored in 1889, have revealed a sequence of layers different from those noted by the former excavators, and no traces of fire-places were found.

The fact that some of our Azilio-Tardenoisian relics were deposited when the 25–30-ft. raised beach was being formed, and that some of the monuments in the west of Scotland are being encroached upon by the sea, throw an interesting light on land movements in these parts.

At the moment it is thought by some archaeologists in England that there has been a tendency for Great Britain to sink in the south and to rise in the north, with the fulcrum somewhere in Yorkshire. That there has been any such rise in Scotland during the last two thousand years is not borne out by archaeological evidence. It has been known for many years that the Outer Hebrides are sinking; and that this movement is still in progress can be seen in places where the peat comes down to the beach and is being broken away by the waves. There is no doubt that in these parts the land has sunk considerably since the early centuries of this era, and possibly this movement may extend back to neolithic times. Two chambered cairns, founded on rock on the shore,

[1] Callander, Cree, and Ritchie, *Proc. Soc. Ant. Scot.*, vol. lxi, p. 169.

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in South Uist and North Uist,[1] are now being lapped by the waves during high spring tides, and two duns, or forts, probably built during the first few centuries of this era, which lie within less than a mile of the North Uist cairn, would now be quite uninhabitable when the water is high. During spring tides, one of these duns, on the tidal islet of Vallay, shows a depth of as much as 12 ins. of water within its inner court.[2] There are other duns in the Outer Isles which show the same sinking.

It would seem that this movement is not local, but extends as far south as Dumbarton on the Clyde, and the Glenluce Sands, Wigtownshire, in the extreme south-west. Nearly thirty years ago, a pile-structure was found on the foreshore of the Clyde at Dumbuck, near Dumbarton.[3] Adjoining it was a well-built dock in which lay a dug-out canoe, 35 ft. long. As these structures are submerged twice a day by the tide, the dock, in its present position, is quite useless for the purpose for which it was made. We can only assume that a considerable sinking of the land has taken place since it was constructed, probably early in our era. In Wigtownshire we do not know of any prehistoric structures showing a similar land movement, but there is a considerable area on the Glenluce Sands from which the sand has been completely blown away, leaving the underlying shingle beds exposed. Within living memory this stretch was devoid of vegetation ; to-day it carries a good growth of plant life. A lowering of the land level which would cause the damming back of enough fresh water to induce the growth of plants would explain this change. Previous to this depression, which can be traced in the Outer Hebrides, the Clyde area, and probably Wigtownshire, it is quite clear that there had been a very pronounced rise, which had taken place after the relics on the Azilio-Tardenoisian sites on Risga, Loch Sunart, at Oban, on Oronsay, at Campbeltown, and in Wigtownshire had been deposited (pl. VII, fig. 2). All these sites, apparently, lie on the 25–30-ft. raised beach, and on three of them—Campbeltown,[4] Cnoc Sligeach on Oronsay,[5] and the Macarthur Cave in Oban—the relics were dropped when the beach was being formed.[6] These sites extend from the north of Argyll to the south of Wigtownshire, so we have to consider a rise of a long stretch of the coast on the west of Scotland, possibly amounting to about 40 ft., subsequent to Azilian times, succeeded by a depression since the Early Iron Age, if not from the Neolithic period. Whether these land movements extended to the east coast is not known, but, as relics similar to some of those found in the 25–

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[1] *Inventory of Ancient Monuments* (*Scotland*)—*The Outer Hebrides, Skye, and the Small Isles*, nos. 385 and 237.

[2] Beveridge, *North Uist*, p. 215.   [3] Bruce, *Proc. Soc. Ant. Scot.*, vol. xxxiv, p. 439.
[4] Gray, *ibid.*, vol. xxviii, p. 271.   [5] Bishop, *ibid.*, vol. xlviii, p. 68.
[6] Anderson, *ibid.*, vol. xxix, p. 228.

30-ft. beach in Argyll have been found on Inchkeith in the Firth of Forth, Scottish archaeologists should keep in view the possibility of finding relics at the same level in the east as in the west. The question of a southern extension of these two land movements might be considered by English archaeologists, because we have archaeological proof of a submergence of land in comparatively recent times in places in the east and west of England, at the Scilly Islands, and in Brittany.
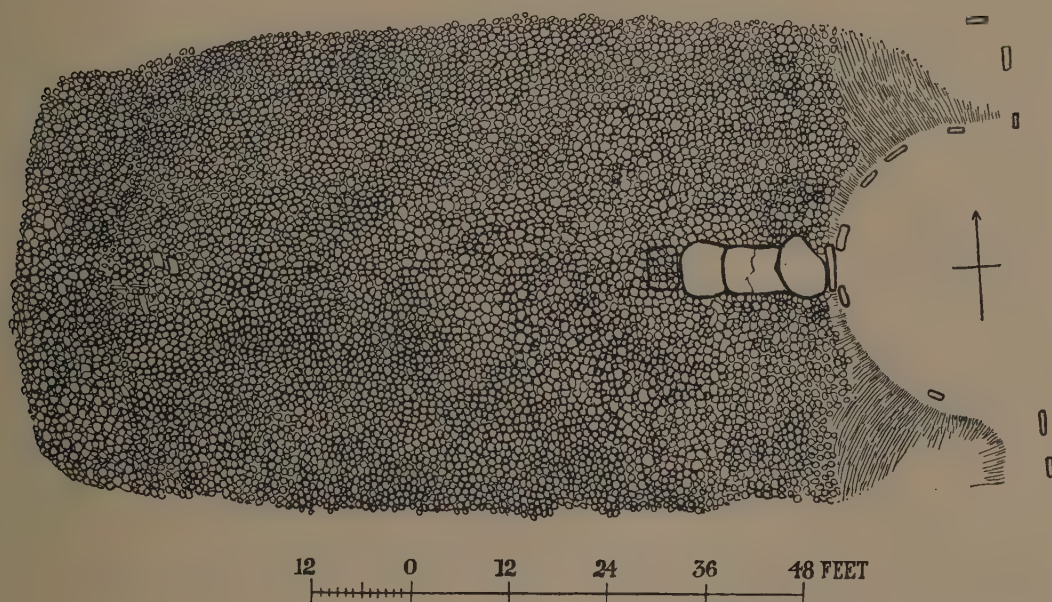
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Fig. 5. Plan of segmented chambered cairn, Carn Ban, Kilmorie Water, Arran.

When we consider the Neolithic period, it will be found that our knowledge of its monuments and relics has considerably increased. Since some of the chambered cairns of Argyll, Caithness, and Orkney were excavated more than forty years ago, no systematic examination of this class of structure was attempted until the early years of this century when the cairns of Bute and Arran were tackled.[1] The result of these latter researches was the discovery of skeletal remains important to the ethnologist, of pottery vessels of types new to Scotland, and of burial chambers quite different in shape from any previously recorded. These monuments, consisting of heaps of stones enclosing long trough-like chambers divided into compartments by septal slabs and entered through low narrow passages, are now termed 'segmented chambered cairns' (pl. VIII, fig. 1, and figs. 5 and 6). This class of monuments was known only in the Clyde

[1] Bryce, *Proc. Soc. Ant. Scot.*, vol. xxxvi, p. 74 ; vol. xxxvii, p. 36, and vol. xxxviii, p. 17.

area, until surveys carried out by the Ancient Monuments Commission (Scotland) and by private enterprise, showed that cairns containing long trough-like chambers extended as far north as the Outer Hebrides, and eastward into Galloway. Whether all of them are divided by septal stones will only be revealed by excavation. So far as I am aware, only one long cairn, and that a partially denuded example, has been dug into in recent years. Situated at Drannandow in the Stewartry of Kircudbright, it was found to contain five segmented chambers, none of them showing entrance passages (pl. VIII, fig. 2).[1] Unfortunately, no relics of any kind, by which its exact period could be determined, were found in any of the graves.

Another important fact concerning our long cairns which has come to light, is that they are to be found in parts of the country where four years ago they were not known to exist. It was thought that they were confined to the northern, western, and southern portions of the country, none having been located on the east between the Moray Firth and the Forth. Now we know of four examples in the counties of Aberdeen, Banff, and Kincardine,[2] and only last September I chanced upon another near St. Fillans, in Perthshire. It will be strange if others are not located, if searched for, but it is to be remembered that in the agricultural districts of Scotland the destruction of burial monuments has been much more thorough than in similar localities in England, the reason being that in the one country they were generally made of stone, and in the other more often of earth. In the one case the stones were, as a rule, entirely cleared away, while in the other it was very difficult completely to obliterate a barrow, even though it had been partially levelled and then ploughed over.

When we come to the pottery of the period (pl. x, fig. 2), it will be found that very few records of discoveries have been published since the excavations of the Bute and Arran cairns were described. It does not follow, however, that no further finds of this class of relic have taken place. At least seven new localities in Scotland have produced neolithic pottery, nearly all in the form of small shards, only one complete vessel having been found, and that in Aberdeenshire. Hitherto, almost the whole of the Scottish neolithic pottery which has been

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Fig. 6. Plan of chamber, Carn Ban.

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[1] Edwards, *Proc. Soc. Ant. Scot.*, vol. lvii, p. 56.
[2] Callander, *ibid.*, vol. lviii, p. 23, and vol. lix, p. 21.

described is sepulchral ware and came from graves, the only exceptions being a dozen small pieces from pit-dwellings in Wigtownshire,[1] and fragments of four large vessels from a pit in Morayshire,[2] which are probably domestic.   To these two discoveries of domestic pottery can now be added one in the Glenluce Sands in Wigtownshire, and another on an inhabited site in Rothesay, which also yielded up saddle querns and some grain.   The last-mentioned discovery is one of great importance, as it is only the second neolithic dwelling site to be recorded in Scotland,[3] the other being the pit-dwellings in the Mye Plantation in Wigtownshire ;[4] and it shows that agriculture was practised in Scotland in neolithic times.

Very little scientific work has been done in the way of investigating the various problems connected with the commoner relics of the period, such as flint implements.   Practically there has only been haphazard collecting, with little attention directed to the keeping of records.   Very few sites of flint factories have been described, and, although many good collections of arrow-heads have been brought together, the other typical implements which were to be found in the same localities were generally ignored.   Scotland is not a flint country like England, there being only one district, in Buchan, Aberdeenshire, where the material is to be found in any considerable quantity.   The result is that the north-eastern counties have always been recognized as the most fruitful field for the flint collector.   Wigtownshire, which drew supplies of light grey flint from Ireland, has yielded a fair harvest, and some good collections have been made in the south-east, in the basin of the Tweed, though this is not generally known.   If collectors could be induced to undertake the search for flint implements in other districts, the area of their distribution would be much extended.   But any search for these relics, even on ploughed land, must be done in a thoroughly scientific fashion, if the work is to be of any value to archaeology.   By carefully recording every find and noting its locality on a large scale map, a surprising amount of information would probably be obtained about the distribution of the population who made the implements, sites of habitation would be discovered, and relative numbers and types of tools and implements would be determined.

In the field of Bronze Age antiquities, there has never been any systematic examination of the burial monuments in Scotland comparable with those under-taken by Greenwell and Mortimer in England.   Indeed, the only sustained

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[1] Mann, *Proc. Soc. Ant. Scot.*, vol. xxxvii, p. 389.
[2] Young, *The Reliquary*, vol. ii, New Series (1896), p. 39.
[3] Perhaps certain sites of flint factories in Aberdeenshire should be included, but little excavation has been carried out on them, and no pottery has been found.
[4] Mann, *Proc. Soc. Ant. Scot.*, vol. xxxvii, p. 389.

series of excavations seems to have been that carried out by C. E. Dalrymple in the stone circles of Aberdeenshire seventy years ago. Certainly numerous cairns have been deliberately opened, and many more have been removed for utilitarian purposes, yielding considerable numbers of relics in the shape of pottery and other objects which have been duly recorded and preserved. But even where the exploration was carried out by people interested in the monuments, in very few cases was any attention paid to the structural peculiarities, apart from those immediately connected with the burial chamber. This, perhaps, is not to be wondered at, because it is extremely difficult to detect drystone building or other structural arrangements in what, to the uninformed, seems to be a simple heap of stones piled up over a burial. The work of excavating a cairn should not consist of the mere exposure of the expected central grave and the removal of any relics it may contain, but the whole structure should be removed, care being taken to watch for settings of stones within the mound, and every inch of the underlying soil should be examined for sepulchral remains and other relics. The necessity for this will be seen by a perusal of three of the latest reports of excavations of cairns submitted to our Society.[1]

We have seen that there is nothing to report about the excavation of stone circles for many years past, but valuable information regarding them has been derived from the survey of these monuments in the north-east of Scotland carried out under the Gunning Fellowship of our Society, nearly up to the time of the establishment of the Ancient Monuments Commission. It was well known that Scotland was very rich in stone circles, but few realized, until the results of the above survey were published, that the number which had existed in Aberdeenshire alone amounted to about two hundred. Many different varieties of stone settings have been recorded, some of them being confined to restricted areas, but, before the survey of the country is completed, there is no doubt that others will fall to be noted. This was my own experience when surveying the prehistoric monuments of East Lothian in 1913 for the Ancient Monuments Commission,[2] when a number of circles, consisting of small pillars projecting little more than 1 ft. from the ground, were seen. On the island of Mull, also, I have observed several unrecorded alignments of fine tall stones.

The question of the origin of the megalithic monuments of Great Britain has attracted considerable attention amongst archaeologists, and it has been accepted by many that their prototypes are to be found in Mediterranean lands. In spite of this, from the peculiar arrangement of some of the stones in several

[1] Cree, *Proc. Soc. Ant. Scot.*, vol. xlviii, p. 112; Craw, *ibid.*, vol. xlviii, p. 316; Edwards, *ibid.*, vol. lvii, p. 65.

[2] *Inventory of Ancient Monuments* (*Scotland*)—*East Lothian*, p. 110, no. 172; p. 113, no. 185; p. 141, nos. 240 and 241.

of the Hebridean round chambered cairns,[1] we are strongly tempted to suggest that the origin of the Scottish stone circle is to be found in Scotland and not abroad. Some of the cairns have no marginal setting of stones, and others have a regular kerb of fair-sized stones placed closely together round their circumference, and, again, others have boulders, pointed stones, and slabs, set at irregular intervals round the periphery. The next step is seen in a cairn, which has a ring of fine large stones, some of them set so far within its margin that the lower parts of these pillars are covered to a depth of about 5 ft., and their tops only are seen projecting above the mound (pl. VII, fig. 1). Next, the cairn appears within a fully developed circle, impinging on the arc of the circle at one place only, and occupying a very small part of the area enclosed by the standing stones. A further advance is to be noted in those cairns which lie within the circle, completely detached from it.[2] This is followed by the appearance of the smaller Bronze Age cairn erected within a circle. Finally, the cairn is dispensed with, and only the circle is left.

Discoveries of rock sculpturings, in the form of cup-and-ring marks, spirals, and other designs, continue to be made in new localities. As their occurrence in the districts which have already been systematically surveyed does not seem to be general, and does not always coincide with that of their contemporary monuments, a map showing the distribution of those markings for the whole of the country might well disclose important information regarding the routes by which the people who made them penetrated into the country. In recording these markings, something more is required than merely stating their locality and describing their arrangement. Every group should be carefully planned by rubbings, special attention being given to its correct orientation, as a claim is now being put forward that these sculpturings are set out astronomically. If this can be substantiated, it will indicate a knowledge of astronomy on the part of our early forefolk that few, at the moment, are prepared to credit.

It is only in very recent times that inhabited sites of the period have been located in Scotland. Two kitchen-middens excavated in East Lothian, one at North Berwick[3] and the other near Gullane,[4] yielded Bronze Age pottery bearing some resemblance to the beakers found in short cists. One of the shards from the first site bore the imprint of three grains of wheat, which proved that the people who occupied it were familiar with the growing of grain. The discovery of a double handful of wheat, in direct association with fragments of

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[1] *Inventory of Ancient Monuments* (*Scotland*)—*The Outer Hebrides, Skye, and the Small Isles*, nos. 632, 524, 389, 457, 228, and 89.
[2] Fraser, *Proc. Soc. Ant. Scot.*, vol. xviii, p. 341.
[3] Cree, *ibid.*, vol. xlii, p. 253.
[4] A. O. Curle, *ibid.*, vol. xlii, p. 308.

what seemed to be Bronze Age pottery, on the Culbin Sands, Morayshire, pointed in the same direction.[1] No traces of dwellings were found on these sites, but from excavations elsewhere we now know that huts built on circular foundations of stone were occupied by the Bronze Age population of the country. These hut-circles, often measuring from 12 ft. to 15 ft. in diameter, are found in groups from Caithness to Galloway, and from Aberdeenshire to the Lothians. They are usually associated with small cairns of approximately the same diameter. In some districts hundreds of these cairns are to be seen on a single hill-side. As it had been noted that frequently the hut-circle and the attendant small cairns were found in the vicinity of typical Bronze Age cairns and stone circles, it was suggested that the smaller cairns belonged to the same period as these monuments.[2] The accuracy of this deduction has been confirmed by the discovery of Bronze Age pottery in hut-circles in Ayrshire.[3] So far, excavations in the small cairns have been disappointing, as no relics have been found in them. Still, there is a very promising field for research in the hut-circles and small cairns of Scotland.

As the years pass, the fine collections of Bronze Age pottery in the National Museum of Antiquities continue to receive additions. Cinerary urns are more numerous than food-vessels, and the latter than beakers. It is generally believed that the beaker is practically confined to the eastern parts of Scotland, and that only a few stray specimens have been found in the west. But this is not quite correct, as fragments of many vessels of undoubted beaker type have been collected in considerable numbers on the Glenluce Sands in the south-west, and similar shards have been found in Coll, in the Inner Hebrides. Occasional discoveries of food-vessels in burial deposits containing cremated human remains indicate clearly the change that was taking place in the burial customs of Scotland before the food-vessel ceased to be made.

During the last few years a peculiar class of pottery has come to light on the Glenluce Sands in Wigtownshire and in East Lothian. Only one complete vessel has been found. In the consistence of its paste it resembles a cinerary urn more than any other class of pottery, but it has a rounded base. Unfortunately, the remains of this pottery consist of fragments too small to give any indication of the height of the vessels or the shape of the base. The ware is coarse and thick, and often reddish in colour, while the section of the rims is quite different from those of the beaker, food-vessel or cinerary urn. The ornamentation also is peculiar. The East Lothian shards were found on a small area which has yielded a short cist burial, beaker pottery, and a very good

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[1] Callander, *Proc. Soc. Ant. Scot.*, vol. xlv, p. 158.
[2] *Inventory of Ancient Monuments (Scotland)—Sutherland,* p. xxiv.
[3] Baird, *Proc. Soc. Ant. Scot.*, vol. xlviii, p. 373.

collection of arrow-heads and other implements of flint. Broken stone axes were also recovered from the site, but no bronze implements or weapons have been found, so far. It would seem that this pottery may belong to the overlap period between the Stone and Bronze Ages. The possible connexion between it and the cinerary urn should be considered. While I feel that we should allow a greater antiquity to some of the cinerary urns than has been the custom, further evidence must be forthcoming before we can suggest that it goes back to such a remote time as the early part of the Bronze Age.

A few words may be said about the implements of the period. Three hoards, belonging to the early, middle, and late Bronze Age, have emphasized, although it may not be claimed that they first indicated, the contemporaneity of certain types of relics. The earliest, from Migdale, Sutherland,[1] showed the flat axe in association with the jet button with V-shaped perforation, completely annular armlets, and a certain type of ear-ring. The next, from Glen Trool, Kirkcudbright,[2] yielded a highly developed flanged axe accompanied by definite types of spear-head, rapier, razor, knife, and pin, along with beads of amber and glass— the period of the razor of the bifid type, but without a perforation, being thus placed farther back than some had previously imagined. The latest, from such a remote corner as Adabrock, near the Butt of Lewis,[3] produced a socketed axe, along with a spear-head, chisel, gouge, and razors, all highly developed, as well as beads of amber, glass, and gold, and the only recorded Scottish example of a bronze hammer; a comparison of the axe, the spear-head and the gouge (a typical woodworker's tool) with similar objects in five other hoards from the mainland of Scotland showed striking resemblances, and led to the conclusion that, even in prehistoric times, improved models and new ideas must have penetrated to the most remote corners of the country at a fairly rapid rate.[4] As to the manufacture of weapons and tools, we can now say definitely that bronze swords, socketed axes, and spear-heads with lunate open-ing in the wings of the blade, were actually made on Traprain Law, East Lothian,[5] and that they were cast in clay moulds.

Much information has in late years come to light regarding the inhabitants of Scotland in the Early Iron Age and Romano-British times. Our Society had for a number of years devoted itself to the excavation of Roman forts and one or two native sites, with very satisfactory results, but, with the examination of the fort at Newstead, a new chapter in the methods of excavation was opened. After the examination of Newstead, four years were allowed to elapse before

[1] Anderson, *Proc. Soc. Ant. Scot.*, vol. xxxv, p. 266.
[2] Callander, *ibid.*, vol. lv, p. 29.   [3] Anderson, *ibid.*, vol. xlv, p. 27.
[4] Callander, *ibid.*, vol. liv, p. 131.
[5] Cree and Curle, *ibid.*, vol. lvi, p. 213.

the Society undertook another excavation, when, in 1914, work was begun on Traprain Law, East Lothian. Seven summers were devoted to the work,[1] and notable results were obtained. Doubtless, what appealed most to the imagination of the general public was the discovery of the wonderful deposit of fourth-century Roman silver plate, 'the Treasure of Traprain', consisting of over 700 ounces of silver, and containing parts of at least one hundred and sixty different vessels and other objects.[2] But of more importance to the student of our native archaeology was the recovery of great numbers of relics of stone, bronze, iron, glass, jet or shale, and pottery, which threw a flood of light on the habits and occupations of the people of south-east Scotland during the first four centuries of our era, when this fortified town was in being. Although there was no evidence of the Romans ever having occupied the hill, coins and pottery made by them, and acquired probably in the course of trade, were discovered. These enabled us to date many classes of objects fairly closely. Previous to this excavation, practically nothing was known about Lowland Scottish pottery of the period. On Traprain Law many shards, but very few complete vessels, were recovered. These were of the coarsest ware, usually devoid of ornamentation, and all hand-made. There was no evidence that the inhabitants of the fort ever used the potter's wheel, which one would think some of them must have seen in use in the Roman stations only 20 to 30 miles distant. This is a very surprising circumstance, when we learn from the relics found that they were expert blacksmiths and cunning workers in bronze and glass.[3]

In carrying out this investigation, difficulties were encountered at first, because, although in most parts the deposits showed a depth of 3 ft. to 4 ft., it was quite impossible to detect any signs of stratification. After some experimenting, it was decided to take off the material in four more or less arbitrary layers, from areas measuring 50 ft. square, a method which was found to be quite satisfactory. Many stones and boulders, often showing little appearance of having been laid down intentionally, were encountered, but none of these was shifted, until the whole of the soil of the layer had been riddled and wheeled away, when any stones which seemed loose or intrusive were removed, and those left were planned. These stones were then cleared off, and the next layer was treated in the same way. The area examined amounted to less than three acres, and, as there are more than twenty acres within the walls, it will take many years of digging before the fort on Traprain Law yields up its last secrets. Outside the walls, also, there are many traces of human occupation which should be investigated.

[1] Owing to the War nothing was done between 1915 and 1919.
[2] A. O. Curle, *The Treasure of Traprain*, p. 5.
[3] A. O. Curle and Cree, *Proc. Soc. Ant. Scot.*, vols. xlix, l, and liv to lviii.

Two other forts, the Mote of Mark in Kirkcudbright [1] and Dun-a-goil in Bute,[2] which also have been investigated in recent times, have produced interesting results. Each was a vitrified fort, and one of the conclusions arrived at regarding both was, that the vitrifaction had been intentional and structural, and not simply the result of signal fires lit on the ramparts. How the vitrifaction was accomplished has not yet been determined, and remains one of the problems to be solved by the archaeologist of the future. The Mote of Mark yielded a very important group of crucibles and moulds of clay for casting pins, penannular brooches, and other ornaments which are believed to belong to about the ninth century, but also as indicating an earlier occupation of the site, two fragments of Roman pottery. There are good reasons for believing that the Scottish vitrified fort goes back to perhaps the first century B.C., because Dun-a-goil produced ring-headed pins with a twist in the neck, a mould of true late-Celtic type, and saddle querns; at the same time there was no evidence of contact with the Romans, who, at the western terminus of the Antonine Wall, were not very far away. Further evidence in favour of a fairly early date for our vitrified forts was found in Duntroon, Argyll, where no less than thirty-six saddle querns, but not a single rotary one, were found.[3]

Very much work remains to be done before the dates of the hill-forts of the south and east and the duns of the north and west can be determined. These constructions occur in great numbers, but very few of them have been explored. A certain amount of progress towards working out their chronology may be attained by planning and mapping, and by comparing these results, but it is only by careful excavation that their periods can be ascertained definitely. This method is slow and costly, and in many cases will probably be disappointing in the matter of relics recovered. The idea at the present moment is that a great proportion of the forts were built in the first few centuries of this era, a smaller number in the first or second century B.C., and, perhaps, some in the Bronze Age. The discovery of about a dozen bronze rapier blades in the bottom of a trench at the fort of Drumcoltran, Kirkcudbright, is given as a reason for assigning it to the Bronze Age.[4] Some of the duns in the north-west, it is believed, may have been erected in medieval times.[5]

No crannogs have been excavated for a great many years in Scotland, but our knowledge of brochs and earth-houses has been advanced through the survey of the monuments in certain parts of the north and west, and by the

[1] A. O. Curle, *Proc. Soc. Ant. Scot.*, vol. xlviii, p. 125.
[2] Mann, *Trans. Buteshire Nat. Hist. Soc.*, 1925, p. 56.
[3] Christison, *Proc. Soc. Ant. Scot.*, vol. xxxix, p. 270.
[4] A. O. Curle, *ibid.*, vol. xlviii, p. 333.
[5] *Inventory of Ancient Monuments (Scotland)—The Outer Hebrides, Skye, and the Small Isles*, p. xxxv.

excavation of a number of these buildings in the same localities. Nothing has been discovered to refute Dr. Joseph Anderson's opinion that these structures belong to the early centuries of the Christian era.

There is no class of prehistoric monument more interesting to the Scottish archaeologist than the broch, and anything that will throw light on its evolution is anxiously awaited. We now know that the broch is not the only defensive structure in Scotland which contains galleries or chambers within the thickness of the wall, for a regular group of forts has been discovered in Tiree,[1] the Outer Hebrides, and Skye,[2] and on the adjoining mainland,[3] and these, though differing very materially from the broch in many of its structural features, have the same narrow doorways and galleries in parts of their walls. The name 'galleried dun' has been applied to them. It is quite possible, when the survey of the whole of the west of Scotland is completed and a number of the galleried duns excavated, we may learn something about the evolution of the broch. If we have not been able to trace this out yet, we have learned that its range extends as far as Wigtownshire in the extreme south-west. The opinion that the galleries within the wall of the broch were living apartments may have to be modified, as it is now known that in some of the Hebridean examples these galleries are too narrow for comfortable occupation by human beings. While they could have been used as store rooms, their purpose may, to a certain extent, be structural. Finally, the discovery of post-holes in the inner court of the broch of Dun Troddan, Glenelg, has demonstrated that the scarcement, which is so regularly met with on the inner wall of the broch, was intended to support the upper end of a lean-to roof.[4]

The survey of Caithness and Sutherland and the excavation of a number of earth-houses in North Uist, Lewis, and Caithness, have revealed several new types showing great variations in form from those of Aberdeenshire, Forfarshire, and the south of Scotland. The most striking of these new types is what may be termed the 'wheel-shaped earth-house',[5] of which several have been opened out in North Uist. This variety of building shows a circular space surrounded by a wall sunk below the level of the surrounding ground, the enclosed area being divided into wedge-shaped compartments, separated from each other by short radial walls, which extend from near the centre of the structure almost as far as the encircling wall. These radial partitions doubtless sustained a roof of

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[1] Beveridge, *Coll and Tiree*, pp. 73–83.

[2] *Inventory of Ancient Monuments (Scotland)—The Outer Hebrides, Skye, and the Small Isles* nos. 449, 450, 483, 484, 541, 576, and 649 to 651.

[3] Bogle, *Proc. Soc. Ant. Scot.*, vol. xxix, p. 181.

[4] A. O. Curle, *ibid.*, vol. lv, p. 83.

[5] One of these structures is described in *Proc. Soc. Ant. Scot.*, vol. vii, p. 165, but it was only very recently discovered that a regular group of them existed in the Outer Isles.

Figs. 1 and 2. Implements of Cetacean bone from earth-house at Foshigarry, North Uist

Fig. 1. View of Early Iron Age cist at Moredun, Midlothian
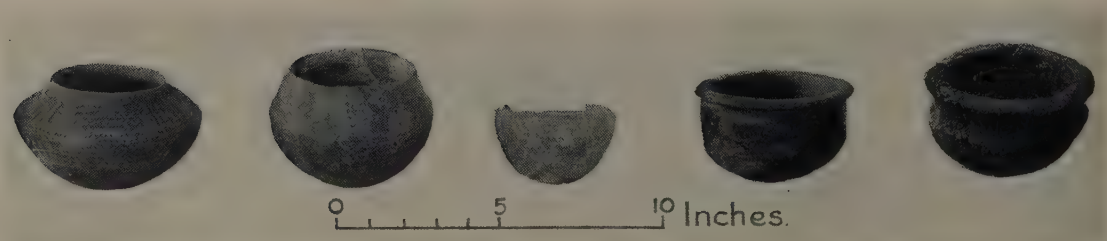
Fig. 2. Scottish Neolithic pottery

slabs. The space between the inner ends of the sectional walls was in some cases built up, leaving in the centre a small area, probably open to the heavens, and containing a hearth. This at once suggests the roofed inner court of the broch, and indicates contemporary erection. Numbers of analogous structures have been noted in Caithness and Sutherland, and are known as 'wags', a corruption of *uamh*, a cave.[1] The wags, however, are more frequently oblong than circular, and, instead of divisional walls, have stone lintels resting on stone pillars at their inner ends. These lintels supported a slab roof.

Another variety of earth-house, consisting of a number of intercommunicating curvilinear underground chambers, was discovered at Foshigarry, North Uist. From it a very large number of relics was recovered. Many of them were made of bones of whales, and these included a number of large implements, quite new to Scottish archaeology, whose use has not been explained (pl. IX). Many of the relics found in the earth-houses are of types found in the brochs. This in itself would indicate that the brochs and earth-houses belong to the same period even though the structural similarities of the buildings, to which we have referred, did not exist. Although Samian ware has been found in quite a number of the brochs and earth-houses of the mainland, it is rather surprising to find that two earth-houses in the remote Outer Hebrides have each produced a small piece of this pottery. As none of the earth-houses in these islands has yielded any typical Viking relics it would appear that many of them had fallen into disuse before that people appeared in these parts, in the end of the eighth century.

Having dealt with the native monuments of the period, we have now to consider our Roman remains. Every one knows that the Roman occupation of Scotland extended over a very small part of the country, and, from beginning to end, only lasted about one hundred years—say from A.D. 80 to A.D. 180; this was followed, some thirty years later, by a punitive expedition under Severus, who penetrated as far north, probably, as the Moray Firth. After that, Scotland was left alone by the Romans, and the only dealings which the Caledonians had with that people were either in the way of trade or when they raided the territory behind the Wall of Hadrian. That the occupation of the south-east of Scotland was a very precarious one and, evidently, not continuous, is demonstrated by the various reconstructions of buildings in so many of the forts that have been excavated. Although of late we have had no discoveries comparable with those made at Newstead,[2] the work of unravelling the various problems connected with the Romans in Scotland makes steady progress. A close examination of the results of excavations carried out, over twenty years

[1] *Inventory of Ancient Monuments (Scotland)—Caithness*, nos. 248 to 263, etc.
[2] James Curle, *A Roman Frontier Post*.

ago, on the forts of Inchtuthil, Ardoch, and Camelon has shown that the idea that the Romans abandoned their conquests in Scotland immediately after Agricola's recall cannot be maintained, and it has proved that the Flavian occupation lasted long enough to fall into several distinct periods, each of which was indicated by considerable reconstructions of buildings within the forts.[1] The exact line of the Antonine Wall between the Forth and the Clyde has been traced from end to end, the position of those portions which had been obliterated by agricultural and other operations having been located chiefly by digging innumerable cross-sections.[2] Also, a careful analysis of the distance slabs along its line has revealed a very complete account of the methods adopted in its construction.[3] Investigations carried out on the extensive fortified sites at Raedykes, near Stonehaven, and Glenmailen in Aberdeenshire, have shown that these entrenchments were undoubtedly the work of the Romans, having probably been the temporary camps constructed by Severus.[4] Under the auspices of the Glasgow Archaeological Society, the forts at Balmuildy[5] and Old Kilpatrick on the Antonine Wall, have been excavated. In the latter, evidence of the occupation of the site by Agricola has

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Fig. 7. Plan of Early Iron Age grave at Burnmouth, Berwickshire.

been obtained. For the last four winters our own Society has been engaged on the excavation of the fort at Mumrills, near Falkirk. This fort, which covers an area of over seven acres, is the largest on the line of the Wall, and, as it is situated near the place where the road to Ardoch and the north branched off from the military way between the Forth and Clyde, it must have been one of great importance. Two years ago, the foundations of the *principia* and of two granaries were exposed, and this winter the foundations of the commandant's house, with a fine example of a bath, two furnaces, and various hypocausted rooms, have been laid bare, some of these showing 4 ft. of walling above the foundations. Several reconstructions of the buildings within the fort have been noted. The number of relics recovered, so far, is not so great as we should have liked, but, as arrangements have been made to continue the excavation of

[1] Macdonald, *Journal of Roman Studies*, vol. ix, p. 111.
[2] Macdonald, *Proc. Soc. Ant. Scot.*, vol. xlix, p. 93, and vol. lix, p. 270.
[3] Macdonald, *Journal of Roman Studies*, vol. xi, p. 1.
[4] Macdonald, *Proc. Soc. Ant. Scot.*, vol. l, p. 317.
[5] Miller, *The Roman Fort at Balmuildy.*

the site during the whole of the summer, it is hoped that much more information regarding the structural arrangements and story of the fort will be obtained.

As to the future, there remain a number of forts on the Wall and in other districts which have not been explored; the site of the fort, which we know must have stood near Crichton on the road from Newstead to Inveresk, has still to be located, and we have yet to discover how the forts in lower Annandale were connected with those in central Scotland. A survey by aerial photography of the possible lines of penetration may be expected to reveal not only some of these sites, but the trace of some of the roads along which the Roman soldiery passed.

Block lent by Society of Antiquaries of Scotland.
Fig. 8. Iron fibula from the Moredun cist: (¼)

Blocks lent by Society of Antiquaries of Scotland.
Fig. 9. Iron ring brooch or buckle from the Moredun cist. (¼)   Fig. 10. Head of iron pin from the Moredun cist. (¼)
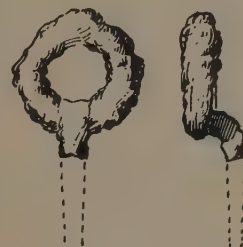
Before dealing with later times, some consideration must be given to the graves and pottery of the period. Although numerous graves of the Stone and Bronze Ages have been discovered in many parts of Scotland, very few which can be assigned to the Early Iron Age have been recognized (pl. x, fig. 1 and fig. 7). One reason for this is the complete change which took place in the burial customs of the country. The practice of placing pottery in the graves came to an end, and thus one of the chief guides in determining the period of prehistoric burial was removed. The habit of depositing other grave goods was not general in the earlier periods, and, though we know that it lingered on into the later time, it seems soon to have been dropped. Only five records of Scottish Early Iron Age burials have been recorded by our Society, four of them describing interments in stone-lined graves, and one in small cairns. As two of the graves resembled the short cist of the Bronze Age, their period might easily have been mistaken if they had not contained other relics besides the skeletal remains. In one of them [1] were found a harp-shaped fibula (fig. 8), a round brooch (fig. 9), and a pin of iron (fig. 10), and, in the other, a small fragment of the same metal adhering to one of the bones of the skeleton.[2] The other two were long graves formed of boulders. One of them yielded a penannular bronze armlet of a form not met with in Scotland before, but obviously belong-

[1] Coles, *Proc. Soc. Ant. Scot.*, vol. xxxviii, p. 427.
[2] Callander, *ibid.*, vol. lv, p. 45.

ing to the period,[1] and the other an iron knife and a pair of the peculiar late-Celtic spoon-like objects of bronze, the first to be found north of the Tweed (fig. 11).[2] The cairn burials are to be found at the Black Rocks, near Gullane, East Lothian.[3] One cairn which was excavated was found to contain five human skeletons, a bronze finger-ring, and an iron knife or dagger.

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Fig. 11. Bronze spoons from grave at Burnmouth, Berwickshire. (⁷⁄₉)

In dealing with the discoveries on Traprain Law, we have seen that many fragments of coarse hand-made pottery were recovered. Considerable quantities have also been found during the excavations of some of the brochs and earth-houses in the Hebrides and in the kitchen-middens on these islands. Unfortunately, owing to a lack of appreciation of the importance of the pottery on the part of some of the excavators, and to the wholesale robbery of the kitchen-middens by irresponsible collectors, very little is known about it. The working out of the chronology of Hebridean and northern ceramics has never been attempted, and the subject is difficult, as hand-made pottery continued to be made in the Western Isles after the middle of last century. Hardly any complete vessels have been found, and, owing to some collectors' common

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[1] Richardson, *Proc. Soc. Ant. Scot.*, vol. lix, p. 116. [2] Craw, *ibid.*, vol. lviii, p. 143.
[3] Ewart and A. O. Curle, *ibid.*, vol. xlii, p. 332.

practice of picking up ornamented pieces only, it has not been possible to recon-
struct any from the fragments left. The pottery exhibits great differences in
size and shape, in the quality of the ware, and in the incised, impressed, and
applied designs with which much of it is decorated.

Having dealt with the antiquities of the earlier periods, we have to consider
those of Early Christian, the Viking and Medieval times. New symbol stones,
some of them bearing symbols never noted before, continue to be unearthed
from time to time, but the meaning of these mysterious sculp-
turings remains to be discovered (fig. 12). The same may be
said about our Ogam inscriptions; new readings of old texts
are submitted, only to be met with adverse criticism.

It is only occasionally that a Viking grave is found, but,
although many of these burials must have been destroyed in
the north and west, a careful survey of the districts occupied
by the Norsemen, carried out by archaeologists familiar with
similar sites in the Scandinavian countries, might yield very
good results. During the past two summers, a group of
peculiar burials have been excavated in Caithness under the
Gunning Fellowship of our Society.[1] Long slab-lined graves
placed within rectangular kerbed enclosures, some of them
covered with a layer of white quartz pebbles from the adjoining
beach, and containing skeletons of men, women, and children
showing marked peculiarities on the lower limbs, were un-
earthed.[2] The only relic discovered was a chain of bronze, of
a type found in the Baltic area, and dating about the tenth
century, which encircled the neck of one of the skeletons.

*Block lent by Society of An-
tiquaries of Scotland.*

Fig. 12. Symbol stone
at Mortlach, Banffshire,
the lower symbol being
unique.

Touching on the late medieval period, we must express
our appreciation of the great amount of work that has recently been accomplished
by H.M. Office of Works in the matter of the excavation and preservation of so
many of our old castellated and ecclesiastical buildings. Such work, generally, is
beyond the resources of private individuals or Societies like ours, but in Aber-
deenshire some very important excavations have been carried out on the castles
of Kildrummy, Coull, and Kindrochit,[3] by a company of Boy Scouts working
under very careful supervision. If this experiment could be extended, but only
under expert direction, far-reaching results might be expected, as not only
would we get the immediate benefit of the work of the boys, but we should soon
have a considerable number of trained excavators and observers springing up,
who would never lose their interest in archaeological research.

[1] Edwards, *Proc. Soc. Ant. Scot.*, vol. lx, p. 160, and vol. lxi, p. 196.   [2] Bryce, *ibid.*, vol. lxi, p. 301.
[3] Simpson, *ibid.*, vol. liv, p. 134; vol. lvii, p. 75; and vol. lviii, p. 45.

Finally, there is one very urgent piece of work that requires to be done in the west of Scotland. It is well known that in the kirkyards of the Hebrides and the adjoining parts of the mainland there is a wealth of sculptured grave-slabs, which are weathering rapidly or disappearing under the rank growth of vegetation that encumbers so many of these neglected enclosures. If a *corpus* of these monuments could be produced, it would tend to their preservation, through the interest raised by the publication. It might also be possible to work out the chronology of the stones, and, perhaps, discover the localities in which many of them were sculptured.

A few words may be said about the general policy of our Society. We accept papers on any subject which, in the widest sense, can be said to deal with the archaeology or history of the country. Sometimes we have been criticized for publishing contributions which are mere surveys of monuments, seeing that this work is now being undertaken by the Ancient Monuments Commission. Unfortunately, it will take many years ere the survey can be completed, and, before that time comes, it is to be feared that many a fine stone and many a monument will have disappeared, for destruction proceeds apace. Certainly reports might be deposited with the Commission, but, as a long time may elapse before publication, and, when it does take place, only a short acknowledgement in the introductory report can be allowed, there is little encouragement for out-siders to undertake such work, especially as many like to see their names associated with their discoveries.

With regard to excavations, we try to restrain all interference with the monuments, unless the proposed operations can be carried out scientifically. Proposals to excavate burial cairns are quite frequent, but the Society deprecates interference with any of these monuments if they seem to be intact, unless their removal is absolutely necessary. Some of our best-preserved examples should be left undisturbed as permanent memorials. The relics and information which might be obtained by their excavation would never compensate for their destruction. There is plenty of work to be done in the examination of dilapi-dated cairns, and on sites that have almost entirely been stripped of their stony mounds; these are to be found in many parts of the country. If we may judge from past experience, excellent results may be expected from such operations.

During the last few years a number of crosses and sculptured stones have been offered to our National Museum of Antiquities, but, if it is at all possible to have these monuments preserved in their original localities, such offers are not accepted.

From this short summary of the recent developments which have taken place in the investigations into the antiquities of Scotland it will be seen that we have added considerably to our knowledge of the development of man

within its borders. Although it had been recognized for many years that Scotland had a wonderful heritage in its prehistoric monuments, it is only since the Ancient Monuments Commission has got to work that we have begun fully to realize what we possess. Archaeologists cannot be too thankful for the appointment of the Ancient Monuments Commissions in the three countries. With such a field for research and an archaeology displaying so many features peculiar to the country, it is disappointing that so few are prepared to take up its study seriously. It is to be hoped that a wider public appreciation of the importance of our native antiquities may be engendered, and that more attention will be devoted to their study in the future. It is a hopeful sign that our Scottish press, generally, are only too willing to receive and publish items of archaeological interest, and it is gratifying to note the increase that has taken place in the number of Fellows of the Society of Antiquaries of Scotland —from about 650 to over 950—in the last seven years.

Discussion

Mr. Armstrong was himself exploring caves and was specially interested in the Inchnadamph find. It was unfortunate that no definite implements had yet been found on which to base the classification, but the fauna was certainly Pleistocene. Had the bones been introduced by water or by animals? Many were cut and marked, and there might be signs of gnawing. Both the reindeer and bear existed in Britain till early neolithic times, and there seems to be an analogy between Inchnadamph and the upper level at Creswell Crags which was Mas d'Azil-Tardenois. It was conceivable that palaeolithic man had followed the game into Scotland. The association of Bronze Age cairns and hut-circles was an important point, also observed in Yorkshire and North Derbyshire, where stone circles were also contemporary. During the past year Iron Age graves, similar to the one shown on the screen, had come to light at Bakewell in Derbyshire.

Mr. Reginald Smith welcomed a representative of Scottish archaeology, who had travelled a long way to deliver a paper full of new and interesting matter. Most of the relics described must, however, be referred to the Picts or still earlier predecessors of the Scots. Medieval references to the reindeer in Scotland might have deterred cave-explorers from equating it with the late La Madeleine species abroad. Flint collecting should, in a sense, be easy in Scotland, as there were only one or two natural sources of the stone, and most surface finds must have been carried by man and were probably worked. The raised beaches and rock-markings remained a mystery to most archaeologists, and he hoped the promised solution would not be long delayed. It was satisfactory to secure a date for any hut-circles, for those in Cornwall looked earlier than the group recently excavated in Wales and assigned to the Roman period. The beaker shown on the screen seemed to have Danish affinities, the shoulder having vertical incisions recalling the fringe often found abroad (*Schnurkeramik*). The small drum or bobbin from Traprain Law, which had not been explained, resembled one from Scarborough. The study of flint implements had not been too popular in Britain, perhaps owing to the fact that in recent years some acquaintance with several sciences was necessary for field-work and interpretation of finds. It would be interesting to see how the results of Scottish archaeologists, stimulated by the discoveries described by Mr. Callander, would compare with those of a society which had been more or less occupied with prehistory for the past hundred and thirty years.

Mr. KEILLER had every reason to be interested in the paper. One of the best long cairns in Scotland had been found in 1926 near Old Deer, but was noticed by Coles in 1903–4, though its true nature was not recognized. He calculated the number of stone circles in Aberdeenshire and Kincardineshire at about 200; they were built in conjunction with cairns and hut-circles. He had excavated a good many, but had never found anything but incinerated burials. Some flint sites along the Aberdeen coast were more prolific in certain types of arrow-heads than any in England. He admired the work of Boy Scouts, and thought the policy of interesting them in archaeology could only have good results.

Dr. WHEELER said the paper was important not only for its contents but as a link between the two societies. The inferences drawn from the 'palaeolithic' finds so far north closely concerned the geology and zoology of Scotland; but till a definite industry was found in association the archaeological value could not be estimated. It was quite probable that the reindeer survived much later in the north than in the south. The ordinary view that in recent geological times Scotland had risen and southern England subsided, with a fulcrum in York-shire, certainly held good for the post-palaeolithic epoch, for the 25 ft. beach of Scotland with its Azilian culture was comparable to the sunken forest-beds of Wales with a similar industry. It was interesting, however, to find that in historic times Scotland had followed the example of England and had begun to show a similar subsidence. In England and Wales the cairns had a somewhat similar history, and excavation was beginning to show that some 'long' barrows were really round barrows with a megalithic chamber. The recent excavation in Wales of a megalithic chamber of the type usual in long barrows had revealed the fact that the barrow was nearly round on plan and was encircled by standing stones. He recognized the neolithic pottery, described in the paper, as akin to the early cinerary type characteristic of some round barrows, and comparable to the late neolithic ware found at Peterborough.

The PRESIDENT acknowledged with sincere thanks the service rendered and the compliment paid to the Society by Mr. Callander's delivery of a valuable review of Scottish advances in archaeology. He only wished that time had allowed a fuller presentation of recent work on later monuments. The prehistoric section was admirable, but medieval remains had also benefited in recent years, in part owing to the activities of the Office of Works. A membership of 950 did great credit to the Scottish society, and gave rise to inevitable comparison.

Mr. CALLANDER replied that the reindeer bones in the cave were slightly rolled and some were gnawed by rodents and larger animals; they were very highly fossilized and rang like stone when struck. A piece of deer-antler was not so highly fossilized as those of the reindeer from a lower level. The Abbé Breuil had assigned the red deer to Mas d'Azil, and the reindeer to La Madeleine or some earlier date. It was to be hoped that drawings on antler would be found next season. Hut-circles were often associated with Iron Age forts in Scotland, and others in duns in the extreme north were later than the Bronze Age, but those associated with small cairns were certainly of the latter date.

IV.—*An Account of the Expenses of Eleanor, sister of Edward III, on the occasion of her marriage to Reynald, Count of Guelders.* *By* E. W. Safford, *Esq.*

Read 10th March 1927

It may appear strange to many that a sister of Edward III should be practically unknown, not only to historians and students of the present time, but also to most of the chroniclers of her own period. The children of Edward II were but four in number, of whom one, John of Eltham, died in his youth. Of the remaining three, Eleanor alone has missed that close attention which her birth and position would seem to warrant. Yet the fact remains that although Mrs. M. A. E. Green in her *Lives of the Princesses of England* devotes a chapter to Eleanor, her list of authorities is a comparatively short one; and the *Historia Gelriae* of Pontanus seems to be the only work which contains sufficient material for compiling a coherent story of Eleanor's life.

The extent of Mrs. Green's researches will be more readily appreciated when one considers that contemporary writers, in some cases, did not even know Eleanor's name. For instance, the author of the *Annales Paulini*, when recording Eleanor's birth, calls her 'Isabella'; in *Scalachronica* she is also referred to as 'Isabella', while Froissart describes her impartially as 'Katherine' and 'Marie'. Nor does contemporary ignorance end here. The author of the *Chronique Normande* states that she was married to the 'Marquis de Blanquebourc', son of Louis of Bavaria. He, too, does not know her name and is content to call her 'la seur du dit roy d'Angleterre'. Pontanus, of course, deals mainly with Eleanor's career after she became Countess of Guelders. Perhaps it would be fitting, therefore, to give a brief outline of Eleanor's life. For this purpose I have gone mainly to Mrs. Green's *Lives*, and have added merely odd references to Eleanor that I have chanced to find, as it were, *en route*.

Eleanor, elder daughter of Edward II and Queen Isabella, was born at Woodstock on the 8th of June 1318.[1] Practically nothing is known of her early years as far as concerns the princess herself, although we have some knowledge of her attendants.

In 1326, John of Eltham, Eleanor, and Joan of the Tower, were in charge of the Despensers. When Isabella, their mother, entered Bristol at the

[1] *Annales Paulini* (Rolls Series), 283.

head of an army, the elder Despenser was delivered to the Queen, together with her three children. Eleanor was transferred to the direct care of Edward III and Philippa his queen in 1328. In this year she was deprived of the company of her sister Joan, who was married to David, afterwards King of Scotland. A tournament was given by William de Montacute in Cheapside in 1331, at which the king and his sister were present. Edward and his nobles were all clothed in splendid raiment 'et ad similitudinem Tartarorum larvati'. Eleanor is singled out by the chronicler and described as a very beautiful girl.[1]

There had been several attempts prior to 1331 by Edward II and Edward III to contract Eleanor to foreign princes. Negotiations were entered into in 1325 for a marriage between Eleanor and Alfonso V, king of Castile, whose sister was at the same time offered to Prince Edward. Owing to differences concerning the dowers, the project came to nothing. In 1329 Edward III directed his attentions toward finding a bridegroom for his sister. Philip VI of France was approached with a view to arranging a marriage with his eldest son John. The protracted negotiations which ensued resulted in failure. During the following year the king's secretary, William Trussell, was sent to Aragon in an endeavour to secure Peter, eldest son of Alfonso IV of Aragon, as a husband for his master's sister. Eleanor was rejected for a third time.

The treaty for Eleanor's marriage with Reynald was first discussed while Reynald was visiting England in 1331.[2] During October of the same year the negotiations were provisionally concluded, and the treaty was finally ratified by Edward III in March, 1332.[3] Eleanor left England on 5th May, landed at Sluys on the 6th, and her wedding was celebrated at Nijmegen on 22nd May, 1332.

Reynald, in 1331, had assured Eleanor an income of 16,000 *livres tournois* per annum from the revenues of lands granted by John, Duke of Brabant, to Eleanor and her heirs;[4] while he also declared that, in the event of his death, his heir, the eldest child to be born of his prospective wife, would assure her the enjoyment of her dower, and his other children a yearly sum of 10,000 *livres tournois*.[5] The guarantors for execution were John, Duke of Brabant, and William, Count of Hainault.

Eleanor's first child, Reynald, was born on 13th May, 1334, and Edward, her

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[1] *Annales Paulini* (Rolls Series), 354–5.

[2] As early as June 1331, Louis, Emperor of the Romans, assured the issue of Reynald and Eleanor the free possession of the lands held by Reynald of the Empire, especially as regards the town of Nijmegen (*Table Chronologique des Chartes, etc., concernant la Belgique*, ix, 402).

[3] Rymer, *Foedera* (Record Comm. ed.), II (ii), 834–5.   [4] *Ibid.*

[5] *Table Chronologique des Chartes, etc.*, ix, 418.

second son, in 1336. From the time of her marriage Eleanor seems to have taken no outwardly important part in public affairs, and apparently devoted all her time to her domestic responsibilities.

The next noteworthy period in her life was in the year 1342, when Reynald, her husband, for some obscure reason, endeavoured to divorce her. Pontanus, cited by Mrs. Green, states that the alleged cause was that Eleanor had become a victim to a leprous disease. The steps which Eleanor took to convince her husband of his error were of a dramatic nature. According to Pontanus, she appeared suddenly before Reynald and his court, threw off her mantle and, having but a scanty garment beneath, was able to prove quite easily to all present that Reynald was mistaken. In consequence of her action a reconcilia-tion took place. This story is, however, obviously vulnerable, and Mrs. Green's guess that the estrangement was brought about by political intriguers who favoured a connexion with France is probably nearer the mark.

As Reynald died in the autumn of 1343, Eleanor's renewal of happiness was not of long duration. But in the short time which she had at her disposal she seems to have interested her husband in the foundation of religious centres. Two Franciscan houses, one at Harderwyck and the other at Deventer, were founded, together with a house for Carthusian monks at Munchausen.

Eleanor's last years were spent in poverty, owing to the conduct of her two sons who, not content with fighting one another, stripped their mother of practically the whole of her wealth. The monastery at Harderwyck repaid its benefactress to some extent by providing her with the necessities of life. Subsequently Eleanor withdrew to Deventer, where she spent the remainder of her life. Notwithstanding her poverty, she appears to have acquired sufficient money to begin building a Cistercian convent at Rosendael, but her death on 22nd April 1355, interrupted the work, which remained unfinished.

The only evidence I have discovered of Eleanor's administration of her province during the early years of her sons is a letter which she sent to the burgo-masters and council of Cologne in 1344, promising her protection to those of that city engaged in commerce on the Rhine and on the Waal.[1]

In the section dealing with Eleanor's marriage, Mrs. Green makes con-siderable use of a Wardrobe Roll for 6 Edward III which contains a great amount of information concerning the expenses connected with the forthcoming ceremony. But this particular roll gives only those expenses incurred up to the time of her departure from England, and nothing is said of Eleanor's progress through Flanders to Nijmegen, where she was married on 22nd May, 1332.

There is, however, an account book for the expenses of the marriage which

[1] *Table Chronologique des Chartes, etc.*, x, 167.

seems to have been overlooked or undiscovered by Mrs. Green.   In the official list of Exchequer Accounts[1] it is described as 'part of an account book'. This is obviously an error, as the book is complete as far as the purpose of its compilation is concerned.   It was simply meant to be a special account of the expenses incurred from the time of the setting up of Eleanor's household in April, 1332, to the disbanding of her establishment some time after her wedding.

This account book, of which a transcript follows, consists of twelve folios, 13½ in. by 10 in., bound in a modern cover of very thick, stiff white paper, and bears the official reference, Accounts, &c. (Exchequer, K.R.), Bundle 386, No. 7. Folios 2 *d*, 9 *d*, 10 *d*, and 11 are blank, while the whole is in an excellent state of preservation.   Each subject heading, with the exception of that of the receipts and gifts of horses, etc., on fol. 12, is marked by an inscribed tab attached to the top right-hand corner of the folio on which the subject begins.

Owing to the fact that the account was not compiled in the form of a journal, a full story of Eleanor's journey must necessitate repeated perusals of the document, and I think it is unnecessary to reconstruct her progress here, since the transcript is available for those interested to draw their own conclusions.   Students of medieval social life will find much to throw more light on their particular corner of research, and those who seek to ascertain the system of medieval household administration will find here a complete story of a subsidiary royal household from its setting up to its final dispersion.

Without desiring to raise controversial issues on points with which only specialists in these matters can deal, we may notice a few items of general interest.   One of them is that of the payment to Hawkin the wheelwright of Calais for making wheels for Eleanor's carriage 'ad modum patrie'.   Keeping within the limits of reasonable inference, one may come to the conclusion that the rougher roads of Flanders demanded wheels in the form of solid discs for a lengthy journey, instead of those of the more artistic but less stout variety.[2]

I have been able to get a few details as to the decoration of the carriage from a roll of issues of cloth, etc., for the year 6 Edward III. Inside the carriage, beneath the tilt (*tectum*), was a canopy (*celura*) of purple velvet, powdered with stars and crescents which were embroidered on to it in gold.   Into the stars were set stones called 'doublets'.   A doublet was usually made by cementing two pieces of glass together with a layer of colour in between.   Outside, over the tilt itself, and including the hood (*mantellus*), was a cover of cloth.   Two

[1] Public Record Office, *Lists and Indexes*, xxxv.
[2] M. Jusserand, in his book *English Wayfaring Life in the Middle Ages*, states that Eleanor's carriage cost £1,000, and quotes Devon's *Issues of the Exchequer*.   According to Devon, however, John le Charer was paid a sum of £20 out of a writ of *Liberate* for £1,000.   Moreover, this sum of £20 included furniture for the carriage.

such covers were supplied, one being green and the other scarlet.   The scarlet cloth was twenty-three ells long and the green cloth seventeen.   There is no indication given of any reason for the difference in length.   The hood was lined with sindon of Tripoli, while Aylsham linen, English linen, and waxed canvas were also employed for decorative and structural purposes.   The waxed canvas, no doubt, was for the tilt, the other materials being for lining.   Small loops (*laquei*) of worked silk are mentioned.   These, one gathers, were meant to be grasped when the occupant wished to stand or when the carriage jolted and swayed more than usual.   For the further comfort of Eleanor and of those chosen to ride with her, there were eleven cushions or pillows made of fustian, with an outer covering of red camaca and stuffed with fine down.   Six of the cushions were an ell in length, and five measured three-quarters of an ell.   In addition, there was a mattress made of green 'carde' of Lombardy, stuffed with cotton down.   A woollen tapestry ornamented with birds was also included. I have been unable to find out where this was placed.   Perhaps it was used as a partition, or it may have hung at the rear of the vehicle.   On the other hand, it may have been used as a rug.

Naturally, the appearance of the outside woodwork of the carriage does not receive much attention in this roll, but we are told that the carriage was painted with various coats of arms, and, as the scribe puts it, 'with other devices'.

The number of horses for drawing the carriage was five.   Their hames, traces, and collars were covered with red leather, and the saddles of the three horses to be ridden were made of red leather, and had painted on them the arms of England and Guelders.

The reference to the payments to servants in the household of James Buk', burgess of Sluys (fol. 7), accompanied by the remark 'prout mos est in patria illa', seems to imply that organized 'tipping' was not an English institution. Corroboration is found in another entry, on fol. 8, of payments to servants in a house at Malines where Eleanor was entertained.   Here we get, in addition to the explanation concerning the custom of the country, the somewhat dry comment 'ut dicitur'.   One may suggest, then, that it was not usual in England at that date to distribute money to household servants as a matter of course.

The picture of Thomas of Abingdon, Eleanor's *clericus marescalciae*, being imprisoned at Ghent for the alleged non-payment of some carters (fol. 5 d), is not without its humour.   The Flemings, with their proverbial readiness to assert their rights, did not quietly submit, one can quite well believe, to the methods of 'royal purveyors', and they saw to it, no doubt, that Thomas confined any high-handed behaviour to his immediate subordinates.   His deliverance cost 73s. 1d.

Of minstrels there are naturally many mentions, and we may gather that Eleanor was not greatly displeased with the efforts of the minstrel called 'Baggepiper', as his reward of twelve pence does not compare unfavourably with the donations to other musical performers. There was a large gathering of these entertainers on Eleanor's wedding-day, according to the amount paid for their services. The sum of twenty pounds should have sufficed for a considerable number of singers and players.

Alms were distributed and oblations made with regularity throughout Eleanor's journey. On Maundy Thursday thirteen poor people each received a pair of shoes, three ells and a half of cloth of 'Kandelwykstret', and twopence. In St. Paul's Cathedral, a gift of a diapered cloth of gold was made to the high altar, and five shillings were offered at the cross of the northern door. The same sum was offered to the newly made image of the Blessed Virgin in the chapel, where a daily mass was celebrated, and to the shrine of St. Erkenwald. At Westminster a diapered cloth of gold was given to the high altar, and a gold buckle to the shrine of St. Edward.

To a certain recluse at Aldgate a quarter of a mark was given, and five shillings were offered at the shrine of St. Paulinus in St. Andrew's, Rochester.

The offerings in Canterbury Cathedral were as follows: a diapered cloth of gold at the high altar; a brooch at the shrine of St. Thomas; five shillings at the head of the same saint; five shillings at the point of the sword with which he was killed; 4s. 7d. for celebrating mass at his shrine; five shillings at the tomb in which he was first buried; and five shillings at the image of the Blessed Virgin in the vault.

Besides the gift of a cloth of gold to the high altar in St. Augustine's, Canterbury, five shillings were offered at each of the shrines of St. Augustine, St. Adrian, and St. Mildred, while there were two further offerings of five shillings each at the relics in the revestiary and at the cross of the church.

Five shillings at the tomb of St. Thomas of Dover and fivepence for the celebration of mass were the offerings at Dover. A penny each was given to twenty-four poor people who came seeking alms on the day on which Eleanor put to sea, the 5th of May, and half a mark was given to a woman hermit dwelling near the same town.

Forty poor persons seeking alms on Eleanor's arrival at Sluys were rewarded with a penny each.

At Calford, in the church of the nuns, a gold buckle was offered at the image of the Blessed Virgin, and at the oil of St. Catherine. Calford, or Calfvoort, which is about eight miles WNW. of Malines, had a hospital of the Blessed Virgin. In 1552 a convent of twenty Augustinian nuns from Heyendonck, near Malines, was transferred to Calfvoort by the authority of the

bishop of Cambrai. At this date there were only four nuns remaining in the hospital at Calfvoort.[1]

The amount of Eleanor's oblations in the principal church of Nijmegen was eleven shillings, while five florins of Florence, equivalent to fifteen shillings of English money, were offered in the chapel of the castle of Nijmegen, on the day on which Eleanor, according to the English fashion, went to the church with a candle after her wedding.

In the section *Necessaria*, or Sundries, are included payments for expenses incurred by the treasurer, the marshal, the comptroller of the wardrobe and other officers of Eleanor's wardrobe and household, in their work of preparing and setting up the establishment of the princess.

Purchases were made of writing materials, a coffer for alms-money, leather bags, hooks, hammers and locks, and horses and saddles. Two friars minor who were to accompany Eleanor were provided with horses, saddles, and surcingles.

Boatmen who conveyed Eleanor and her family from Westminster to Lambeth received three shillings as their fee. Master Adam, Queen Isabella's farrier, received five marks. He went with the queen's carriage, in which Eleanor travelled from Stratford-atte-Bow to Dover. The journey and return occupied five days.

Here follow issues to ship- and barge-masters. It can be seen from this entry that the various branches and departments of the household did not intermingle, but travelled separately.

For making a certain bath for the princess, with herbs and other ingredients, William de Corneville received 1s. 6d. Although the payment was made on the 21st of May, one supposes that the bath was prepared for her on the previous day—the day of her wedding.

The Count of Guelders presented a bear to Edward III, and Philip de Windsor, keeper of the bear, took the animal by water from Nijmegen to Sluys. It may also be remarked that on the return journey from Nijmegen to Sluys the harness and trappings were conveyed by boat instead of being taken overland in carts.

For the transportation of the princess, her family and her horses, by small boats to the ship on which they were to sail, the mayor of Dover was paid 2l. 10s.

A sum of fifteen shillings was paid for a pair of knives with handles of amber and silver, enamelled 'de amello de plyt''. Laborde, in his *Glossaire Français du Moyen Âge*, states that this is 'émail d'applique', explaining that this enamel was worked on small plaques, and mounted so that it could be screwed or soldered on to a piece of gold- or silver-work, or even sewn on stuff.

In the section *Dona*, apart from presents to minstrels, are payments to

[1] Lemire (Aubert), *Opera Diplomatica et Historica* (2nd ed.), iii, 644.

various persons who had rendered services to Eleanor during her journey. For example, Margaret de Romsey, her bed-maker, was paid a sum of two pounds; Adam the Farrier, before-mentioned, received one mark; John Clark, Queen Isabella's currier, received ten shillings; a forerider was paid half a mark; John de Deen and Gerard, the ushers of Queen Philippa and Queen Isabella respectively, received one mark each; the master and the navigator of the ship *Peter* or *Peter Bard*, in which Eleanor sailed, were paid five pounds and ten shillings respectively; the bailiff of Sluys, for his assistance to officers of the household in making divers purveyances in Sluys, received ten shillings; James de Abingdon, guardian of the houses of the Count of Flanders in Bruges, was paid ten shillings; half a mark was paid to Reynald le Riene, *palefridarius* of Queen Philippa, who presented Eleanor with a palfrey called 'Bayard de Burgh'; two serjeants-at-arms of Malines presented Eleanor with four long cloths and four tuns of Rhein wine on behalf of that city, and were rewarded with ten shillings each; six shillings were paid to a boy who presented Eleanor with a deer at Rosendael; Guy, serjeant-at-arms of Arnhem, who gave Eleanor six tuns of Rhein wine on behalf of the people of the town, received 10s. 6d.; Cortinus, a falconer, received eighteen shillings when he made a present to the princess of six sparrowhawks; William de Corneville, who made a pilgrimage to the Three Kings of Cologne, was paid one mark towards his expenses.

Concerning the sections labelled 'Nuncii' and 'Feoda' little need be said. John de Bristol seems to have undertaken most of the errands on behalf of Eleanor's household, and there seems to be nothing of sufficient importance to be singled out for comment, unless one mentions a mission of the Abbot of Langdon on the king's business to the Count of Hainault and to the Duke and Duchess of Brabant.

For the wedding gifts of jewels to various officials was purchased a collection which comprised such articles of adornment as brooches, buckles of gold set with rubies, emeralds and pearls; silk of gold embroidered with pearls; belts of silk of 'subtle work', 'powdered' with pearls, and mounted with silver gilt enamelled; a purse of Turkey leather fashioned in like manner; pointed knives with handles and case of silver gilt enamelled and ebony cut and mounted. Some of these were apportioned as follows: to each person a gold brooch with precious stones, a belt of 'subtle work' garnished with pearls and decorated with silver gilt enamelled, and an ell of silk embroidered with gold wire and large oriental pearls.

William de Montacute was made a special present of a belt of gold wire mounted with gold, and garnished with large oriental pearls, a purse of gold wire sewn with 'subtle work' and powdered with large oriental pearls, together with a gold brooch set with emeralds, balas-rubies, rubies, and large pearls.

Two more purses and two more belts were purchased, and the last group of persons received each a gold brooch, set with precious stones and pearls. John Teysaunt, the king's minstrel, was presented with a belt mounted with enamelled silver and gold and an ell of worked silk.

All the above gifts of jewellery, with the exception of that to William de Montacute, were made by the advice and counsel of Edward de Bohun, William de Montacute, and Ralph de Neville, the king's seneschal. It is interesting to see in the list of recipients the name of Walter de Manny or Mauny. As his name does not appear in the section for *Feoda*, probably he did not cross over with Eleanor, but joined her train in Flanders.

The last page deals mainly with gifts of horses. Eleven chargers were given to the Count of Guelders, one to a certain house of St. John of Jerusalem at Nijmegen, and one to the bishop of Winchester. There were also gifts of palfreys and pack- and cart-horses to various people, among whom was the Count of Guelders, who received two palfreys, six pack-horses, and six cart-horses.

The tight control which the Exchequer kept over royal household accounts is demonstrated by the various marginal notes—'per consideracionem baronum', 'examinatur', and so on—which show that the matter was closely gone into. It may be noticed that the queries are rather with regard to expenses claimed by responsible members of Eleanor's household in connexion with the preparation of accounts and with subsistence allowances, than with regard to purchases made and largesse distributed.

With regard to the system adopted in the transcript, I have extended the names of two towns only: Canterbury and Dover.[1] All other place-names are copied as they stand in the document. Eleanor's name is sometimes written 'Alianora' and at other times 'Alienora'. When she has been designated in the MS. by 'A', I have extended this to 'Alianora'. The section *Jocalia* is spread across two folios in the MS., the left-hand side (fol. 11 *d*) giving details of the purchases of jewels, and the right-hand side (fol. 12) particulars of their distribution. The two sides are bracketed together, and I have been forced by obvious printing difficulties to deal with the various paragraphs piecemeal. The effect is somewhat disjointed, perhaps, but I hope none the less clear. In an endeavour to get some uniformity with regard to the letters *u, v, i,* and *j,* I have adopted the following method. When the letters in question do not begin a word *u* is used for *v,* and *i* for *j.* If, however, they are initial letters, then *v* and *j* are used: e. g. *eiusdem, juxta, diuersi, vendicio.*

The Latin of the MS. seems somewhat worse than that which is usually met with in medieval documents. This necessitates a rather too frequent use

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[1] *Nouum Magium* (Nijmegen) is always written in full in the MS.

of the word *sic*.   As a transcript, however, is of little use unless the original is rigidly adhered to, I do not apologize for the frequency of this italicized comment.   Here and there one finds words in the French form, these being, of course, indeclinable.   In such cases I have made no remark.   In the first entry under *Oblaciones* the contraction *prec'* which one might expect to be rendered by the nominative or ablative absolute, has been extended by the scribe into *precii*.   This, I think, justifies my using the genitive case in all like instances.

In conclusion, I am pleased to be able to acknowledge my indebtedness to Mr. Charles Johnson, F.S.A., for his assistance in making clear obscure points as well as for his kindly advice and helpful criticism generally.

Marriage expenses of Eleanor, sister of Edward III   Oblaciones (P. R. O., E. 101 ; 386/7, f. 12)
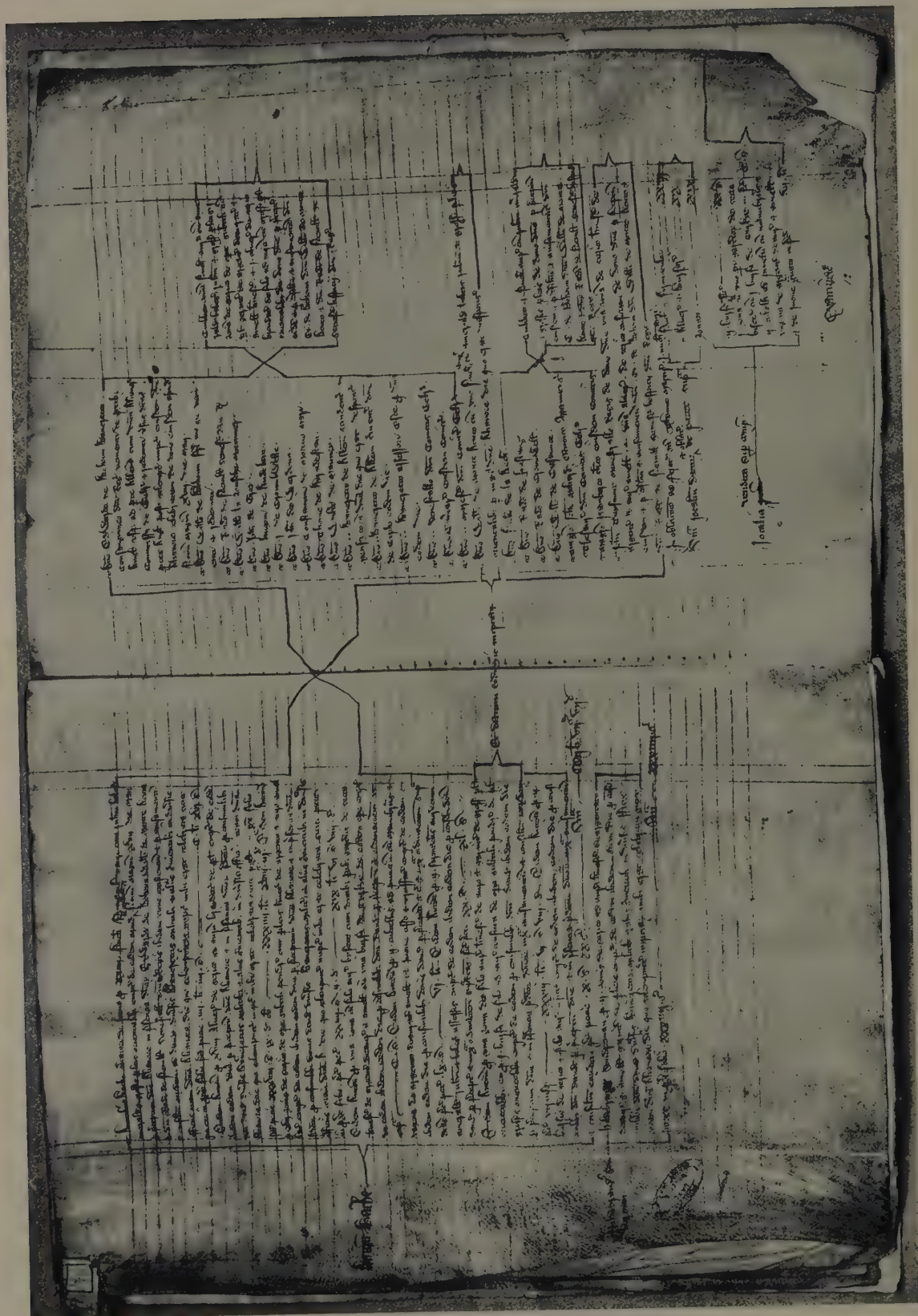
Marriage expenses of Eleanor, sister of Edward III. Jocalia (P.R.O., E. 101; 386/7, f. 11 d, 12)

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APPENDIX
RECEPTA DENARIORUM

Recepta denariorum pro expensis hospicii domine Alienore sororis Regis, euntis versus partes f. 1 Gerlie causa maritagii sui, per vices et loca diuersa de diuersis, per dominum Robertum de Tong' tunc Thesaurarium ipsius domine Alienore, inter xviij diem Aprilis et xxvj diem Julii anno regni Regis Edwardi tercii a conquestu sexto videlicet

De magistro Roberto de Ayleston' Thesaurario Regis Anglie per manus Jacobi Nicholas et sociorum suorum mercatorum de societate Bardorum London' per litteram patentem testificantem receptam cuius data est xviij die Aprilis   lxvj*l*. xiij*s*. iiij*d*.

De eodem magistro Roberto per manus eorundem mercatorum de societate Bardorum ibidem per consimilem litteram testificantem receptam cuius data est xxv die Aprilis   cclx*l*.

De eodem magistro Roberto per manus dictorum mercatorum de societate Bardorum London' per consimilem litteram patentem testificantem receptam cuius data est xxvij die Aprilis

ccvj*l*. xiij*s*. iiij*d*.

De eodem magistro Roberto per manus dictorum Jacobi et sociorum suorum mercatorum ibidem per litteram patentem testificantem receptam cuius data est xxx die Aprilis   ccc*l*.

De eodem magistro Roberto per manus eiusdem et sociorum suorum mercatorum de dicta societate apud Bruges per litteram testificantem receptam cuius data est iij die Junii   I mar.

De eodem magistro Roberto per manus eorundem mercatorum ibidem per consimilem litteram patentem testificantem receptam cuius data est iiij die Junii   .   xl*l*.

De eodem magistro Roberto per manus dictorum mercatorum de societate Bardorum ibidem per consimilem litteram testificantem receptam cuius data est xj die Junii   cc mar.

De eodem magistro Roberto per manus dictorum mercatorum de societate Bardorum de Florencia per litteram testificantem receptam cuius data est London' xxv die Julii   l*l*.

Item de diuersis rebus venditis diuersis ad diuersa precia London' videlicet—De domino Thoma de Aldon', pro una mappa parisiensi continente xiij ulnas iij manutergia de Roan quidlibet de vj ulnis et dimidia et pro diuersis speciebus sibi venditis London' xj die Junii, *iiij l. ix s*. De Johanne Pyrie, pro uno equo carectario sibi vendito[1] ibidem xxiij die Junii, *xx s*. pro iij equis carectariis venditis *lxxij s*. De domino Johanne le Smale, pro uno equo sibi vendito xxvj die Junii London', *xx s*. De Edmundo de Shireford, pro ij equis sibi venditis iij die Julii London', *lxxiij s. iiij d*. De magistro Roberto de Stratford, pro v equis carectariis j carecta curta cum una bahuda longa vj die Julii, *vj l. xiij s. iiij d*. De Johanne Bargeman, pro uno equo caruanno sibi vendito vij die Julii, *ij s. iiij d*. De Johanne Gerard, pro uno somario sibi vendito vij die Julii, *l s*. De domino Thoma de Abyndon', pro ij barellis ferro ligatis et vj tankardis similiter ferro ligatis, *vij s. vj d*. De Petro Scot', pro uno equo sibi vendito London' viij die Julii, *xxvj s*. De domino Cancellario Wyntoniensi Episcopo, pro una chariotta cum vj hernesiis pertinentibus vj equis tractantibus dictam chariottam, *liij s. iiij d*. De domino Johanne le Smale, pro diuersis mappis manutergiis speciebus et aliis diuersis rebus sibi venditis, *xij l. ij s. iij d*. De domino Thoma Dabindon, pro j mappa sibi vendita, *x s. vj d*. De Roberto de Harle, pro cera operata sibi vendita, *xxvj s*. De Ricardo de Asheton', pro cera coffris linea tela, *xxj s. v d. ob*. De Nicholao de Ʒerdele, pro j bahuda ij paneriis j brocha ferri j hamo ferri j louche j micatorio[2] iiij barellis pro salsa iiij tankardis eidem venditis, *xj s. x d*. De domino

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[1] MS. reads *sibi vendito carectario.*
[2] Instrument qui réduit en miettes.—Maigne d'Arnis, *Lexicon Manuale ad Scriptores Mediae et Infimae Latinitatis.*

Thoma Dabyndon', pro ij bahudis et ij sellis somariis, *xiij s. iiij d.*   De Waltero Bacoun, Ricardo de Tynemuth', et Willelmo Busch', pro car[ne] eis vendita, *xij s.*   De domino Roberto de Tong', pro iiij barellis ferri et xij tankardis ferro ligatis, *xvj s.*   •   Summa xlv *l.* ij *s.* j *d. ob.*

f. 1 d

De domino Arnaldo (*sic*) Comite Gerliensi, per diuersas vices et loca diuersa per manus diuersorum, in subsidium expensarum, videlicet pro expensis equorum et vadiis garcionum familie domine Alianore eundo de Bruges usque Nouum Magium, ubi nupcie fuerunt solempnizate, juxta conuencionem inter dominum Regem Anglie et predictum Comitem factum

cxlij*l.* ij*s.* iiij*d. ob.*

vendicio super compotum

Idem reddit compotum de xij libris de diuersis jocalibus super compotum venditis, sicut continetur inferius titulo de Jocalibus [1]   xij*l.*

De Thesaurario et Camerariis Regis, ad receptam scaccarii, xij die Aprilis anno viij°, per manus Johannis le Smale contrarotulatoris, in partem solucionis xxx*l.* xviij*s.* ij*d.* debitorum eidem per billam dicti Roberti custodis, sicut continetur in pelle memorandorum de eodem anno viij°

vj*l.* xvij*s.* x*d.*

De eisdem Thesaurario et Camerariis, secundo die Julii anno viij°, per manus dicti Johannis le Smale, in persolucionem predictorum xxx*l.* xviij*s.* ij*d.* sibi debitorum ut supra, ad receptam scaccarii   xxiiij*l.* iiij*d.*

De eisdem Thesaurario et Camerariis, xvij die Octobris anno x°, ad receptam scaccarii ut supra, per manus Johannis de Hecheye scutiferi hospicii Regis, in persolucionem denariorum debitorum Roberto de Middelton' et aliis de familia dicte domine Alianore, per billam dicti Roberti custodis, sicut continetur in pelle ut supra   xv*l.* iij*s.* iiij*d.*

De eisdem Thesaurario et Camerariis, xxxj die Julii anno x°, ad receptam scaccarii ut supra, per manus Thome de Kendale, in persolucionem xx*l.* ix*s.* xj*d.* debitorum Abbati de Langedon' per billam dicti Roberti custodis, sicut continetur in pelle memorandorum ut supra   xx*l.* ix*s.* xj*d.*

De eisdem Thesaurario et Camerariis predicto xxxj die Julii, ad receptam scaccarii ut supra per manus Thome de Kendale, ad opus predicti Abbatis de Langedon' executoris testamenti Roberti de Cantuaria in persolucionem xiij*l.* xj*s.* x*d.* eidem Roberto per billam dicti Roberti custodis debitorum sicut continetur in pelle memorandorum ut supra   xiij*l.* xj*s.* x*d.*

Summa totalis recepte ex utraque parte istius folii   Mcciiij. ix*l.* iiij*s.* vj*d.*

Summa totalis expensarum domine Alianore sororis domini nostri Regis ut patet in fine rotuli expensarum eiusdem hospicii   Dlxix*l.* ij*s.* j*d. ob. q.*

f. 2

OBLACIONES ET ELEMOSINA

Diuersi pauperes die Cene

xiij pauperibus, de speciali elemosina domine Alianore sororis Regis, cuilibet eorum j par socularum, precii paris v*d.*, *v s. v d.* eisdem pauperibus, cuilibet eorum iij ulne dimidia panni de Kandelwykstret, precii ulne xiiij*d.*, xlv ulne dimidia *liij s. ij d.* ; et in denariis eisdem datis videlicet cuilibet *ij d., ij s. ij d.*   Summa lx*s.* ix*d.*

Oblaciones domine Alianore

In oblacionibus domine Alianore in ecclesia cathedrali Sancti Pauli London', in diuersis locis, videlicet ad magnum altare eiusdem ecclesie j pannus ad aurum diasperatum, ad crucem hostii borialis eiusdem ecclesie *v s.*, ad annunciacionem Beate Virginis in noua operacione in eadem ecclesia *v s.*, ad ymaginem Beate Virginis in capella ubi missa eiusdem Virginis cotidie celebratur

[1] This entry is inserted in a different hand.   *See* p. 139.

v s., et ad feretrum Sancti Erkenwaldi episcopi in eadem ecclesia *v s.*   In oblacionibus eiusdem domine in ecclesia conuentuali Westmonasterii ultimo die Aprilis ad diuersa loca, videlicet ad magnum altare eiusdem ecclesie j pannus ad aurum diasperatum, et ad feretrum Sancti Edwardi Regis ibidem j firmachulum auri   Summa xx*s.*

Cuidam mulieri incluse juxta Algage (*sic*), de speciali elemosina domine Alianore, per manus Matillidis Wylynton recipientis denarios de domino Thesaurario ad deferendum eidem ultimo die Aprilis   iij*s.* iiij*d.*
Quedam anchorita

In oblacionibus domine Alianore ad feretrum Sancti Palini (*sic*) in ecclesia conuentuali Sancti Andree Roffensis, ij die Maii   v*s.*
Oblaciones domine Alianore

Fratribus et sororibus hospitalis Sancti Nicholai de Herbaldoun' de speciali elemosina domine Alianore, per manus Isabelle de Lynne recipientis denarios apud Cantuariam, iij die Maii   x*s.*
Fratres et sorores de Harbaldon'

In oblacionibus domine Alianore in ecclesia conuentuali Christi Cantuariensi ad diuersa loca, videlicet ad magnum altare eiusdem ecclesie j pannus ad aurum diasperatum, ad feretrum Sancti Thome Martyris j nouche, ad capud eiusdem *v s.*, ad punctum gladii quo idem Sanctus interficiebatur *v s.*, ad missam celebratam ante feretrum Sancti Thome in denariis datis diuersis *iiij s. vij d.*   In oblacionibus eiusdem in ecclesia conuentuali Sancti Augustini Cantuariensi eodem die videlicet iij die Maii, j pannus ad aurum diasperatum ad magnum altare in eadem ecclesia.   Ad feretrum Sancti Augustini *v s.*, ad feretrum Sancti Adriani *v s.*, ad reliquias in reuestario *v s.*, ad feretrum Sancte Mildrede *v s.*, et ad crucem eiusdem ecclesie *v s.*
Oblaciones domine Alianore

                                             Summa xxxix*s.* vij*d.*

In oblacionibus domine Alianore in ecclesia Christi Cantuariensi iiij^to die Maii, videlicet ad ymaginem Beate Virginis in volta *v s.*, ad tumbam Sancti Thome ubi primo sepeliebatur *v s.*, et ad missam ibidem celebratam *xiiij d.*   Summa xj*s.* ij*d.*

In oblacionibus eiusdem apud Douorram v^to die Maii, in ecclesia conuentuali eiusdem ville, videlicet ad tumbam Sancti Thome de Douorra *v s.*, et ad missam celebratam ibidem *v d.*   Summa v*s.* v*d.*

xxiiij pauperibus petentibus elemosinam de domina Alianora die quo ipsa iuit ad mare, videlicet cuilibet eorum j*d.*, per manus Thesaurarii apud Douorram, quinto die Maii   Summa ij*s.*
Diuersi pauperes

Cuidam heremite manente juxta Douorram de speciali elemosina domine Alianore quinto die Maii ibidem, per manus domini Nicholai Toug' elemosinarii, recipientis denarios ad deferendum eidem   vj*s.* viij*d.*
Quedam heremita

In oblacionibus domine Alianore ad ymaginem Beate Marie, et ad oleum Sancte Katerine, in ecclesia sanctimonialium de Calford', xv die Maii, j firmaculum auri *v s.*   v*s.*
Oblaciones domine Alianore

In oblacionibus eiusdem domine in maiori ecclesia ville Noui Magii, in qua dicta domina desponsata fuerit, in precio unius floreni de cathedra *vj s.*, et in denariis *v s.*   Summa xj*s.*

In oblacionibus domine die quo ipsa iuit ad ecclesiam cum candela sua post solempnitatem nupciarum, secundum modum Anglie, in precio quinque florenorum de Florencia in capella castri Noui Magii   Summa xv*s.*
Oblaciones domine in auro

Quadraginta pauperibus petentibus elemosinam de domina Alianora die quo arripuit apud Lescluses in Flandria, de speciali elemosina domine Alianore, videlicet cuilibet illorum *j d.* ibidem x die Maii per manus thesaurarii, recipientis denarios ad distribuendum inter eosdem   iij*s.* iiij*d.*
Quadraginta pauperes

NECESSARIA

Pergamena incaustum empta

Willelmo de Shrouesbury pergamenario London', pro v duodenis pergamene ab eodem emptis precii duodene xviij*d.*, et pro uno barillo nigro coreo cooperto ad incaustum infraponendum, et pro pomice et incaustum (*sic*) emptis similiter ab eodem, iij die Aprilis, per manus proprias

vij*s.* ix*d.* *ob.*

Computarii empti

Thome Brasse mercemonario London', pro quinque solidis computatoriis emptis ab eodem iij die Aprilis, per manus Johannis de Clisby recipientis denarios in garderoba eodem die   xvj*d.*

Expense J. de Clisseby

Johanni de Clisseby clerico garderobe domine Alianore, misso de London' usque Staunford, videlicet ad Curiam Regis tunc ibidem existentem, pro quibusdam negociis hospicii dicte domine Alianore tangentibus, et ibidem per aliquod tempus per preceptum consilii Regis moranti, pro litteris dicti domini nostri Regis habendis et deferendis ad diuersos comites et duces Flandrie Brabancie et Almannie, pro expensis suis sic eundo, morando, et redeundo, xiiij die Aprilis, London', per manus proprias   x*s.*

Expense R. de Tong'

Domino Roberto de Tong' thesaurario, moranti London' circa diuersa negocia et quamplures et diuersas prouidencias ibidem faciendas et prouidendas pro familia et expensis hospicii domine Alianore sororis Regis, videlicet a xxx die Marcii usque xxvj diem Aprilis, primo die computato, videlicet per xxv dies, percipienti per diem x*s.*, per compotum secum factum London', xvj die Aprilis, per manus proprias xiij*l.*   Eidem, moranti London' retro dominam Alianoram pro equis emendis ad opus dicte domine Alianore, et pro aliis necessariis per preceptum eiusdem, per iij dies, percipienti per diem ut supra   Summa xiiij*l.* x*s.*

Expense scutiferorum

Roberto de Middelton', Ade de Pontefracto, Johanni Hethey, Roberto Chaundos, Hugoni Burgiloun', et Waltero de Wyggemor, istis sex scutiferis missis de Curia domini Regis per ipsum Regem et consilium usque London', ad interessendum et morandum in comitiua domine Alianore euntis versus partes Ghelrie, pro expensis eorundem scutiferorum, hominum et equorum suorum, ibidem morantium antequam incipiebatur aulam teneri, videlicet per x dies, quolibet eorum percipiente per diem xij*d.*, per compotum eisdem factum London', xxvj die Aprilis, per manus proprias   lx*s.*

Expense H. marescalli

Henrico de Newynton', marescallo hospicii domine Alianore, venienti London' per preceptum consilii Regis, et moranti ibidem circa diuersas prouidencias aulam et cameram officium et hospicium tangentes, pro expensis oris sui, hominum et equorum suorum, per xix dies per quos stetit London' circa dictas prouidencias ordinandas, percipienti per diem xij*d.*, per compotum secum factum London' xxvij° die die (*sic*) Aprilis, per manus proprias   xix*s.*

Expense scutiferorum de officio

Johanni Pyrie butillario, et Rogero de Sancto Albano emptori coquine, et Willelmo de Rampton' panetario, istis tribus scutiferis pro consimilibus expensis hominum et equorum suorum, videlicet per x dies, percipientibus per diem ut supra, per compotum secum factum London' dicto xxvij die Aprilis, per manus proprias   xxx*s.*

Expense scutiferorum aule

Rogero de Northwode, Johanni de Seyton', Johanni de Wylington', Guillelmo de Florencia, et Galfrido de Weston', istis quinque scutiferis pro consimilibus expensis suis, a xxij die Aprilis usque xxvj diem eiusdem mensis, primo die computato et non ultimo, videlicet per iiij^{or} dies, cuilibet per diem xij*d.*, per compotum eidem (*sic*) factum xxix die Aprilis, per manus proprias

xxiiij*s.*

Expense clerici marescalcie

Domino Thome de Abyndon' clerico marescalcie, moranti London' circa diuersas prouidencias faciendas et ordinandas tangentes officium suum marescalcie, per xx dies antequam incipiebatur aula, percipienti per diem xviij*d.*, per compotum secum factum London' xxviij die Aprilis, per manus proprias   xxx*s.*

Willelmo Bussh' valletto coquine, venienti London' per preceptum consilii Regis ad ordinandas et faciendas diuersas prouidencias pro coquina, pro consimilibus oris sui expensis *vij s.* Thome de Sandwych' lardario coquine, pro consimilibus expensis oris sui, per manus proprias *vj s. viij d.* Thome le Port', pro eodem, per manus proprias *v s.* Johanni de Welles piscatori, pro eodem, per manus proprias *x s.* Johanni de Smetheleye, pro eodem, per manus proprias *v s.* Ricardo de Tynemuth' valletto salsarii, pro eodem, per manus proprias *v s.* per compotum eisdem factum London' xxviij die Aprilis, per manus proprias xxxviij*s.* viij*d.*

<div style="text-align: right">*Expense valettorum diuersorum officiorum*</div>

Johanni le Hanaper de Wodestret in London', pro quodam cophino nigri corei cooperto et ferro ligato empto ab eodem, pro quadam olla argenti infraponenda et custodienda pro elemosina, per manus proprias, ultimo die Aprilis vj*s.* viij*d.*

<div style="text-align: right">*Cophini (sic) empti*</div>

Johanni de Thresk' cissori domine Alianore, moranti London' circa officium suum cissoris faciendum, per xix dies, percipienti per diem pro expensis oris sui vj*d.*, videlicet a primo die Aprilis usque xxix (*sic*) diem eiusdem mensis, primo die computato et non ultimo, ix*s.*; eidem pro expensis oris sui hominum et equorum suorum, a dicto xix° die Aprilis, quo die positus erat ad vij*d. ob.* per preceptum domine Alianore, usque primum diem Maii, utroque die computato, videlicet per xij dies, percipienti per diem xij*d.*, *xij s.*, per compotum secum factum London' xxix° die Aprilis, per manus proprias Summa xxj*s.*

<div style="text-align: right">*Expense J. de Thresk'*</div>

<div style="text-align: right">*f. 3 d*</div>

Ricardo de Staundon', pro vj saccis de correo tannetto emptis ab eodem et liberatis diuersis officiariis diuersorum officiorum, videlicet iiij sacci ad garderobarium robarum domine Alianore, et ij ad infraponendum mapparum et [aquariorum], et pro iij bahudis emptis similiter ab eodem et liberatis pro diuersis officiis, London' xxix die Aprilis, per manus proprias iiij*l.* xviij*s.*

<div style="text-align: right">*Sacci et bahude empti*</div>

Johanne de Graueshende, pro consuicione tuelarum de capella, per manus proprias, London', die supradicto viij*d.*

<div style="text-align: right">*Consuecio tuellarum de capella*</div>

Soero de Valencenis et Johanni de Tong' clericis de capella domine Alianore, venientibus London' et morantibus ibidem ante incepcionem aule, videlicet per x dies, utroque percipiente per diem pro expensis suis hominibus et equis suis xij*d.*, London', xxix die Aprilis, per manus proprias xx*s.*

<div style="text-align: right">*Expense clericorum capelle*</div>

Seruicio Perle de Almannia, pro uno equo grisello empto ab eodem pro quodam summario ad deferendum coffrum garderobe, per manus proprias, London', xxix die Aprilis iiij*l.* vj*s.* viij*d.*

<div style="text-align: right">*Equi diuersi empti*</div>

Hugoni Mareschal, pro ij equis ab eo emptis et liberatis pro chariottis, precii equi xxx*s.*, per manus proprias, London, ultimo die Aprilis lx*s.*

Roberto de Kyngeswode, pro uno equo badio empto ab eodem ibidem die supradicto et liberato ad coffrum candelarii, per manus proprias xl*s.*

Johanni Sprund, pro uno equo empto ab eodem et dato Othelino Lalemaund seruienti Regis ad arma, London', ultimo die Aprilis, per manus eiusdem Johannis x *mar.*

Paruo Waltero, mercatori equorum in Smethefeld', pro duobus equis ab eodem emptis et liberatis duobus fratribus minoribus euntibus cum domina Alianora in partibus Gerlie, London', ultimo die Aprilis, per manus proprias eiusdem Parui Walteri cvj*s.* viij*d.*

Willelmo Pykerell' selario London', pro tribus sellis emptis ab eodem et datis per dominam Alienoram diuersis, videlicet Ottelino Lalmaund j precii xij*s.* viij*d.* cum surcynglis, et ij duobus fratribus precii selle xij*s.* cum toto apparatu, xxiiij*s.* Summa xxxvj*s.* viij*d.*

<div style="text-align: right">*Selle empte*</div>

Johanni le Smale, venienti de partibus Gloucestrie ad mandatum domini Regis et consilii sui usque London' in auxilium ad arraiandam familiam pro hospicio et alia necessaria pro solempnitate nupciarum domine Alianore sororis ipsius domini Regis, videlicet a x° die mensis Aprilis anno regni Edwardi tercii a conquestu sexto usque xxv diem eiusdem mensis, per xvj dies, utroque computato, capienti per diem x*s.* viij*l.*

<div style="text-align: right">*Expense J. le Smale contrarotulatoris*</div>

Crochetti empti

Willelmo le Lokier' de London', pro ccc crochettis grossis et iiij^or martellis et iiij serucis emptis ab eodem pro capella, aula et camera domine Alianore, per manus proprias, London', ultimo die Aprilis   xxiiij*s.*

Passagium domine Alianore

Diuersis batellariis ducentibus dominam Alianoram et familiam suam ultra aquam Tamesie, videlicet de Westmonasterio usque Lambhuth', pro stipendiis suis, per manus thesaurarii, ultimo die Aprilis   iij*s.*

Expense Mathei de Mersston'

Mathio de Mersston' valletto camere domine Alianore, eunti de Roucestr' usque London', ad querendum ibidem nouum lectum domine Alianore, pro expensis suis, per manus proprias, primo die Maii   iij*s.*

Expense domini N. Touk'

Domino Nicholao Touk' elemosinario domine Alianore, venienti London' et moranti ibidem ante incepcionem aule, videlicet per xj dies, percipienti per diem xij*d.* pro expensis suis hominibus et equis suis, apud Cantuariam iij die Maii, per manus proprias   xj*s.*

Expense J. le Smale

Johanni le Smale contrarotulatori, eunti de Cantuaria usque Douorram pro nauibus apparandis pro passagio domine Alianore, pro expensis suis, iij die Maii, per manus proprias   x*s.*

Expense dextrariorum

Magistro Ade ferratori domine Regine Isabelle, misso cum vij dextrariis trahendis currum dicte domine Regine cum domina Alianora filia eiusdem de Stratford atte Bowe usque Douorram, et reducenti eosdem dextrarios de ibidem usque Stratford atte Bowe, pro expensis eorundem una cum expensis valettorum custodiencium dictos dextrarios, per v dies, quolibet die xiij*s.* iiij*d.*, per manus eiusdem magistri Ade ferratoris, v^o de (*sic*) Maii   lxvj*s.* viij*d.*

f. 4

Passagium domine Alienore sororis Regis in Flandriam cum diuersis in comitiua sua existentibus

Simoni de Sancta Elena, magistro nauis vocate Laurencius, passanti familiam domine Alianore sororis Regis de Douorra usque Lescluses in Flandria, pro allocacione eiusdem nauis, per manus proprias *c s.*   Willelmo Rote, magistro bargee Andree Hurtyn, pro consimili allocacione eiusdem bargee *iiij l.*   Reginaldo Parson, magistro nauis vocate la Percy, passanti vj dextrarios vij palefridos v somarios et ij hakenos, pro allocacione eiusdem nauis *lxx s.*   Willelmo Lorkyn, magistro nauis Simonis Daniel, assignate pro vj dextrariis de curru domicelle, xiiij somariis de diuersis officiariis cum aliis equis de familia *lxx s.*   Simoni Rote, magistro nauis vocate Nicholas, passanti xxvij equos cum chariotis *lxx s.*   Salmoni Bateman, magistro nauis vocate Hurtyn, assignate pro senescallo et pro quinque equis de chariotis et aliis equis scutiferorum de familia *lxx s.*   Johanni Ainz, magistro nauis Andree atte Halle, pro omnibus clericis *lxx s.*   Nicholao Louekok', magistro nauis vocate la Katerine, pro domino Willelmo la Zouche, cum una bargea et una naui Johannis Salcok', per manus Alexandri Hurtyn maioris Douorre *viij l. x s.*   Alexandro Hurtyn maiori Douorre, pro duabus nauibus conductis pro Abbate de Langedon' et pro familia retro existentibus, qualibet naui *lxx s.* per manus eiusdem Alexandri *vij l.*   Salmoni Bateman, magistro bargee Willelmi Monyn, Willelmo Badecok', magistro bargee Nicholai atte Halle, Nicholao Giles, magistro bargee vocate Mariz, Thome Crey, magistro bargee Henrici Person ; istis quatuor bargeeis passantibus familiam domine Alianore in Flandriam, cuilibet earum xxx*s.*, *vj l.*   Reginaldo Person, magistro cuiusdam bargee passanti equos domini Johannis de Crombewell', *xxiij s. iiij d.*   Johanni Monyn balliuo Douorre, pro custuma hominum et equorum ibidem, *vj l.* eidem, pro pontagio, *x s.*   Balliuo de Caleys, pro custuma hominum et equorum curruum et carectarum et males, *c s.*   diuersis hominibus de Kaleys, pro diskippagio, pontagio, portagio, et batillagio diuersorum hominum et equorum de familia domine Alianore, videlicet pro dextrariis, palefridis, somariis, et equis carectariis eiusdem domine Alianore, *xxxvij s.* pro hominibus et equis domine de Chaumpeyn, *x s.*   pro hominibus et equis domine de Vallibus, *viij s.*   pro hominibus et equis Abbatis de Langedon', *xij s. x d.*   pro equis et hominibus domini Johannis de Crombewell', *x s.* et pro ceteris equis de familia dicte domine Alianore, *xiij s. iiij d.*   portagio pro familia

usque nauim apud Douorram, *v s. iiij d.* portagio diuersorum officiorum de grossa naui usque Leschuses (*sic*), per thesaurarium *xj s. xj d.* Balliuo de Grauenyng', pro passagio hominum et equorum apud Grauenyng', *x s.* Summa lxvj *l.* xj *s.* ix *d.*

Otelino Lalmaund seruienti Regis ad arma, misso de la Escluses usque Burges (*sic*) in nuncio domine Alienore per preceptum eiusdem, pro expensis suis, vij die Maii, per manus proprias ibidem · · · iij *s.* Expense O. Lalmaund

Hauekino Welewricht' de Kaleys, facienti rotas chariotti ad modum patrie, per conuencionem factam cum eo vj die Maii ibidem, per manus proprias · iiij *s.* ij *d.* Rote facte

Johanni de Clysseby clerico garderobe, moranti cum familia apud Kaleys et venienti de ibidem usque Bruges, per v dies, percipienti per diem pro expensis suis ij *s.*, per manus proprias, vj^to Maii · x *s.* Expense J. de Clisseby

Ricardo de Leppham, misso de Donekirk' usque Boloyn, ad querendos ibidem iiij^or equos carectarios domine Alienore ibidem existentes, pro expensis suis et dictorum equorum, per manus proprias · · xv *s.* Expense equorum

Bodekino mercemonario de Lesclus, pro ij paribus calciamentorum ab eo emptorum et datorum per dominam Alienoram Ricardo de Fauresham butillario suo, vj^to die Maii ij *s.* Calciamenta empta

Quatuor militibus et ij clericis et quampluribus de familia domini Comitis Gerlensis, venientibus ad dominam Alienoram apud Lescluses et morantibus ibidem per ij noctes, pro expensis suis, per manus maioris ville predicte recipientis denarios in garderoba viij die Maii lxxij *s.* viij *d.* Expense familie Comitis

f. 4 d

Johanni Buk' burgensi ville de Lescluses, pro conduccione domorum suorum in quibus domina Alianora et familia sua hospitabantur, ibidem viij die Maii, per manus Copini Buk' filii eiusdem liij *s.* iiij *d.* Domi conducti

Hauekino de Gaunt pannario de Burges (*sic*), pro ij pannis radiatis de secta scutiferorum emptis ab eodem per preceptum domine Alienore, et datis diuersis scutiferis et menestrallis per eandem dominam, videlicet J. Taysaunt' heraldo domini Regis Anglie, Pamietto de Reett' scutifero domine Regine, Roberto de Harle seruienti Regis ad arma existenti in comitiua eiusdem domine, Petro Bard balliuo de Sandewyche, Johanni Monyn balliuo de Douorra, et Andree Hurtyn custumario eiusdem ville, Ricardo de Willmyngton' fratri Matillidis de Willmyngton', Jacobo Scutillario skiuanni (*sic*) de Bruges, Jacobo Statyn de Bruges, Copino marescallo hospicii domini Comitis Gerlensis, Godelino camerario eiusdem Comitis, Fredewico pannetario, Hermanno butillario, Hildebrando coco suo. Istis xiiij scutiferis cuilibet eorum iij ulne, et iiij ulne libera-bantur domine Alianore, ad faciendum de eisdem secundum libitum voluntatis sue, que faciunt xlvj ulne; et faciunt ij panni, precii panni lx *s.*, *vj l.* Eidem, pro ij pannis de Gaunt de colore viridi emptis similiter ab eodem, precii panni lxx *s.*, et datis eisdem scutiferis supradictis per ipsam dominam, ita ut essent de secta scutiferorum hospicii sui, viij die Maii, per manus proprias, *vij l.* Hauekino pellopario ville de Gaunt', pro xiiij furris agnellinis emptis ab eodem et liberatis dictis xiiij scutiferis pro robis suis, precii pecie ij *s.* x *d.*, per manus proprias, xj die Maii apud Gaunt, *xxxix s. viij d.* Albrighto pannario ville de Malyns, pro ij pannis de diuersis coloribus emptis ab eodem et datis per dominam Alianoram diuersis militibus clericis pro supertunicis estiualibus inde faciendis, videlicet j pannus pro vij militibus, cuilibet iij ulne et dimidia, precii panni, lxxiij *s.* viij *d.*; ij panni pro xiiij clericis, cuilibet iij ulne dimidia, precii panni lxxvij *s.* ij *d.*, *vij l. xiiij s. iiij d.* Eidem, pro dimidio panno empto similiter ab eodem et liberato per ipsam dominam duobus subclericis pro robis inde faciendis, precii *xxv s.* Eidem, pro ij pannis radiatis emptis ab eodem per preceptum domine et liberatis diuersis garcionibus et pagettis diuersorum Panni diuersi empti

officiorum, precii j panni xxxiij *s.* ix *d.* et alterius panni xxvj *s.* viij *d.*, *lx s. v d.*   Eidem, pro vj pannis de diuersis coloribus emptis ab eodem pro scutiferis hospicii domine Alianore pro super-tunicis eisdem faciendis, in subsidium empcionis eorundem de dono domine Alienore, *viij l. viij s. vij d.*   Summa xxix*l.* xx*d.*

Tonsura pannorum	Diuersis tonsoribus pannorum, pro tonsura dictorum pannorum, per manus Johannis de Hadele, recipientis denarios in garderoba domine Alianore apud Nouum Magium, xxj die Maii viij*s.* ix*d.*
Expense N. scutiferi senioris	Nicholao de Thelnetham scutifero seniori retro existenti, videlicet apud Kaleys videlicet cum equis senescalli per iiij dies, percipienti per diem pro expensis oris sui xij *d.*, per manus proprias apud Bruges, x° die Maii iiij*s.*
Valetti de curru	Johanni de Marcham, tenenti currum domine Alianore, Roberto Giles, Willelmo Gay valettis de curru, Roberto de Ayleston' currario currus domicellarum ; istis iiij valettis pro botis suis cuilibet iij *s.*, per manus proprias apud Bruges, x° die Maii xij*s.*
Factura coopertorii et mantellorum	Johanni de Thresk' cissori domine Alianore, pro factura j coopertorii de cammoca et pro furatura ij mantellorum, apud Brugges x die Maii, per manus proprias iij*s.*
Cultelli empti	Francisco de Paris cutillario de Brugges, pro j pari cutellorum ab eodem emptorum ad opus domine Alienore cum manubriis de laumbre et argento amellatis de amello de plyte [1] et libera-torum Jacobo de Montibus pro mensa dicte domine Alianore apud Brugges x° die Maii, per manus Jacobi le Scutiller recipientis denarios de thesaurario xv*s.*

f. 5

Perle grossi (*sic*) empti	Antellino Bache mercatori de partibus transmarinis, pro centum perles grossis emptis per preceptum domine Alianore pro j capa ad opus eiusdem domine Alianore, precii pecie ij *s.* vj *d.* xij*l.* x*s.*
Factura bukettorum	Domino Nicholao Touk' elemosinario, pro ligatura et factura duorum bukettorum pro elemosina ij *s.* vj *d.* et pro factura magni denarii pro oblacionibus domine Alienore iiij *d.* Summa ij*s.* x*d.*
J. seruiens ad arma	Johanni le Smyth seruienti ville de Brugges ad arma, pro auxilio suo inpenso circa herbergagium apud Bruges x die Maii, per manus Galuani Corder militis x*s.*
Expense duorum valettorum	Roberto de Wyndesore et Willelmo Lylie, custodientibus partem garderobe et alia iniuncta hospicii apud Bruges existentibus, pro expensis suis sic morando ibidem, x die Maii v*s.*
Carecte allocate	Henrico Dyn, carectario ville de Bruges, carianti pannos et partem garderobe de Bruges usque Malyns et Gaunt' per ij carectas, per manus Jacoby le Scutiller, x^{mo} die Maii xj*s.* viij*d.*
Frater R. de Bliton'	Fratri Ricardo de Blyton', fratri de ordine Beate Marie de Monte Carmeli, quondam elemosinario domini Edwardi Regis Anglie patris domine Alianore de dono domine Alianore apud Malyns, per manus Johannis le Smale contrarotulatoris, xv die Maii xl*s.*
Restauracio unius tuelle	Cuidam mulieri, pro uno tuello perdito (*sic*) in domo suo (*sic*), in qua domina Alianora et familia comedebant, in restauracione eiusdem tuelle, per manus proprias, xv die Maii xij*d.*
Carecta conducta	Copino, carectario de Malyns, carianti hernesia domini Willelmi de Monte Acuto et senescalli de Malyns usque Nouum Magium, pro stipendio suo per manus proprias ibidem xij*s.* iiij*d.*
Cariagio pannorum	Cuidam carectario carianti pannos de Malyns usque Boscum Ducis per conuencionem cum eo factam ibidem xvij die Maii per manus thesaurarii vij*s.* vj*d.*

[1] Esmail de Plique, de plite et d'oplite, c'est-à-dire d'applique. Émaux exécutés sur plaques de petites dimensions, et montés de manière à pouvoir être vissés, sertis ou soudés sur une pièce d'orfèvrerie, ou même cousus sur étoffe.—Laborde, *Glossaire français du Moyen Âge*, 286.

Die Mercurii xx die Maii apud Nouum Magium, videlicet die quo domina desponsata erat, in distribucione argenti in ecclesia parochiali dicte ville, per manus thesaurarii   xv*l*.   *Distribucio argenti*

Duobus carectariis cum duabus carectis suis conductis ad carianda officia garderobe speciarum candelarum et alia [? iniuncta]¹ hospicium tangencia, de Gaunt usque Nouum Magium, percipientibus per diem vj*s*. per v dies per compotum eisdem factum in garderoba apud Nouum Magium, xvij die Maii, per manus proprias   lxvij*s*. vj*d*.   *Cariagium diuersorum officiorum*

Cok' de Camera et tribus sociis suis, valettis de camera, euntibus de Gaunt usque Nouum Magium cum una carecta allocata ad cariandum nouum lectum domine Alianore et alia ornamenta et paramenta cameram et nupcias eiusdem domine tangencia; videlicet pro carecta per v dies percipientibus per diem vj*s*., *xxx s*.   et pro expensis dictorum quatuor valettorum sic euntium per dictos v dies cuilibet per diem ij*s*., *xl s*.   et pro batillagio equorum et aliorum necessariorum ij*s*. per compotum factum cum eodem Cok' et per manus eiusdem, apud Nouum Magium in garderoba domine Alianore, xvij die Maii   lxxij*s*.   *Cariagium noui lecti et expense quatuor valettorum*

Domino Episcopo Utregenensi, calumpnianti homagium de domina Alianora in capella Castri Noui Magii pro terris quas dicta domina tenet de eodem episcopo pro feodo illius homagii apud dictum castrum, xvij die Maii, per manus domini Galuani Corder militis   xviij*s*.   *Feodum homagii*

[Here is a cancelled payment to Hildebrand Sudreman.   Cancelled, 'quia infra inter jocalium empciones.'   *See* p. 139.]

Nicholao de ꝫerdele, valletto penetrie (*sic*), pereunti de Malyns usque Nouum Magium circa officium panetrie ordinandum, pro expensis suis per v dies, percipienti per diem xviij*d*., et pro batillagio iiij*d*. *ob*., per compotum secum factum ibidem dicto xvij die Maii, per manus proprias   vij*s*. x*d*. *ob*.   *Expense valetti panetrie*

Willelmo de Corneuill', valletto de camera, facienti quoddam balneum pro domina Alianora, pro herbis et aliis auxiliis sibi inpensis, apud Nouum Magium, xxj die Maii   xviij*d*.   *Quoddam balneum*

f. 5 d

Philippo de Wyndesore, custodienti ursam presentatam domino Regi Anglie per dominum comitem Gerlensem, super expensis suis eundo per aquam de Nouo Magio usque Lescluses in Flandria, apud Nouum Magium, xxv^to die Maii, per manus proprias   vj*s*.   *Custodiens ursam*

Johanni de Dordrachto, pro quadam naui ab eodem conducta de Nouo Magio usque Lescluses pro diuersis hernesiis militum domicellarum clericorum scutiferorum et aliorum de familia, per conuencionem cum eo factam apud Nouum Magium xxvj^to die Maii, per manus proprias   xxxvj*s*.   *Nauis conducta*

Ricardo Louell' et Johanni Bargeman, vallettis officiorum hospicii domine, euntibus cum dicta naui cum dictis harnesiis custodiendis, pro expensis eorum sic eundo, videlicet utrique eorum xv*s*., apud Nouum Magium, xxvj die Maii, per manus Ricardi Louell'   xxx*s*.   *Expense valettorum custodiencium hernesia per mare*

Willelmo Bright' et Ricardo de Huntingdon', pagettis panetrie et butillarie, euntibus per mare cum parte dictorum officiorum pro expensis suis utrique iij*s*., per manus proprias, apud Nouum Magium, recipientibus denarios in garderoba de domino thesaurario, xxvj die Maii   vj*s*.   *Expense pagettorum*

Isamberto, naute de Nouo Magio, pro quadam naui conducta de ibidem usque Durdracht' cum diuersis hernesiis hospicii, una cum expensis ij^orum valettorum custodiencium dicta hernesia in dicto (*sic*) naui existencia, apud Nouum Magium, xxvij die Maii   xxxij*s*.   *Nauis conducta*

Domino Galuano Corder militi, pro emendacione cuiusdam stabuli pro equis domine Alianore, pro denariis per ipsum solutis apud Bruges cuidam homini facienti dictum stabulum per manus dicti domini Galuani Corder, recipientis denarios apud Nouum Magium, xxvij die Maii   xxxiij*s*.   *Emendacio stabuli*

¹ The word in the MS. consists of 9 minims with *cta*, and carries a contraction sign above.

Passagium familie ultra la Moys	Hardekneutho, custodienti passagium aque de la Moeys, pro passagio hominum et equorum de familia Regis Anglie, per manus Rogeri de Tong' apud le Graue, xxvij die Maii vj*s*.
Expense J. de Ely	Johanni de Ely, misso de Tournout' usque Douorram maiori et balliuis eiusdem ville pro naui prouidenda pro passagio familie Regis in Angliam, pro expensis suis, per manus proprias, xxviij die Maii vij*s*. j*d*.
Ductor vie	Reginaldo de Nouo Magio, ducenti familiam Regis Anglie in Brabanciam, videlicet de Nouo Magio usque Boscum Ducis, pro salario suo ibidem, xxix die Maii, per manus proprias vj*s*. viij*d*.
Passagium apud Dondremound'	Godekyno de Frys, custodienti passagium apud Dendremound', pro passagio hominum et equorum curruum et carectarum et aliorum herenesiorum de familia ibidem, ultimo die Maii vj*s*.
Nauis conducta	Johanni Bargeman et Willelmo Louell', pro quadam naui per eosdem conducta in Flandria usque London', pro diuersis hernesiis dominarum militum domicellarum clericorum scutiferorum et aliorum de familia cariandis, per manus eiusdem recipientis denarios apud Bruges, iij die Junii lxvij*s*. vj*d*.
Duo menestralli	Duobus menestrallis facientibus menestralcias suas coram dominabus et familia existentibus apud Bruges, de dono per consilium senescalli, thesaurarii et contrarotulatoris, ibidem, iij die Junii vj*s*. viij*d*.
Deliberacio T.Dabyndon	Balliuis ville de Gaunt' super deliberacione Thome Dabyndon clerici marescalcie, ibidem incarcerati pro allocacione cuiusdam carecte de Gaunt usque Nouum Magium cariantis diuersa officia prout carectarii sibi inposuerunt non soluta; ibidem, per manus dictorum balliuorum recipiencium denarios in Aula Placiti dicte ville, tercio die Junii lxxiij*s*. j*d*.
Expense R. Durraunt	Domino Ricardo Duraunt, clerico contrarotulatoris, misso de Leyre usque Maghlinium car' (*sic*) per preceptum domine, pro diuersis pannis diuersorum colorum ibidem emendis, pro expensis suis sic eundo morando et redeundo, et pro canebo dictos pannos inuoluendo et cordis emptis et maletoute, ibidem, per manus proprias recipienti denarios apud Bruges, iij die Junii xvj*s*. iij*d*. ob.
Expense J. de Clisseby et v dextrariorum et v hominum	Johanni de Clisseby, clerico garderobe, misso per senescallum de Bruges usque Rosindale cum litteris suis ad reducendum currum domicellarum cum v dextrariis domine Comitisse de Gerlens', super expensis suis et dictorum dextrariorum et v hominum custodiencium eosdem dextrarios, apud Bruges, iij die Junii, per manus proprias lx*s*.
f. 6	
Pelle empte	Otelino Lalmaund, pro xij pellis capriolarum emptis per ipsum per preceptum domine Alienore, et datis domino Comiti Gherlie, London', xxx die Aprilis, per manus proprias xij*s*.
Batillagium domine et familie	Alexandri (*sic*) Hurtyn, maiori Douorre, pro batillagio domine, familie sue, equorum suorum, cum paruis batellis usque nauim, per manus proprias ibidem, quinto die Maii l*s*.
Custuma de Wytsand	Perceuallo de Amyens, custumario de Wytsand, pro custuma sellarum saccorum capitum hominum et malarum, ibidem, viij die Junii, in precio xix florenorum de Florencia lvij*s*., et in pontagio portagio et batillagio vij*s*. vj*d*. Summa lxiiij*s*. vj*d*.
	Summa huius pagine precedentis usque hic xxiiij*l*. x*s*. vj*d*. ob. probatur
Cariagium noui lecti	Mathio de Merssheton', valetto de camera domine Alienore, pro denariis per ipsum solutis pro cariagio noui lecti dicte domine de Bruges usque Gaunt, ibidem, xj die Maii iij*s*.
Passagium et lac emptum	Willelmo de Vaus, pro denariis per ipsum solutis diuersis locis per preceptum domine, pro passagio eiusdem et pro lacte, apud Arnham juxta la Ry, xxiij die Maii, per manus proprias ibidem vj*s*.

Othelino Lalmaund, seruienti Regis ad arma, pro denariis per ipsum solutis diuersis locis per diuersas vices diuersis seruientibus liberantibus domine Alianore pro luso suo in camera sua apud Nouum Magium et apud Rosendale, xxiij die Maii, per manus proprias xvij*d.* *(margin: Lusum in camera)*

Diuersis batillagiis pontagiis et portagiis pro quibusdam de familia apud Douorram, per manus diuersorum portitorum batillariorum et aliorum recipiencium denarios pro pontagio ibidem, viij die Junii vj*s.* viij*d.* *(margin: Diuersi (sic) batillagia pontagia)*

Willelmo de Shrouesbury, pergamenario London', pro pergameno et incausto, emptis ab eodem ad transcribendum et faciendum libros et rotulos hospicii domine Alianore, London', xj die Junii iiij*s.* *(margin: Pergamenum emptum)*

Ricardo de Assheton', clerico speciarie et candelarie, venienti de partibus Gloucestrie usque London' ad faciendum et ordinandum pro dictis officiis suis antequam incipiebatur aula, per iiij dies, percipienti per diem pro expensis suis xij*d., iiij s.* Eidem, moranti London' super deliberacione residuorum officiorum predictorum per iiij dies, percipienti ut supra, *iiij s.* Summa viij*s.* *(margin: Expense clerici speciarie)*

Nicholao de Ꝫerdele, valletto panetrie, venienti de eisdem partibus usque London' ad ordinandum similiter pro dicto officio suo per iiij dies, percipienti ut supra pro expensis ibidem iiij*s.* *(margin: Expense valletti pantrie)*

Domino Johanni le Smale, contrarotulatori, moranti London' ad compotum diuersorum officiariorum audiendum et recipiendum, et eunti de ibidem usque Farnham domino Cancellario Episcopo Wyntoniensi, et de ibidem usque Wodestok' domino Regi tunc existenti, et de ibidem usque London' per preceptum consilii Regis, ad ordinandum circa vendicionem diuersarum rerum remanencium in garderoba domine Alianore, pro expensis suis sic morando eundo et redeundo et iterum morando, videlicet ab xj die Junii usque iij diem Julii, utroque die computato, per xxij dies, percipienti per diem xs., per manus proprias, iij die Augusti xj*l.* *(margin: Expense contrarotulatoris)*

Johanni de Tong', clerico de elemosina domine Alianore, moranti in hostagio apud Bruges pro quinquaginta libris sterlingorum, mutuatis de Jacobo le Scutillier skiuanno ville de Bruges, pro expensis et vadiis familie Regis venientis de partibus Gelre (sic) versus dominum Regem, videlicet a v*to* die Junii usque xviij diem Augusti, quo die venit London', utroque die computato, videlicet per lxxiiij dies, percipienti per diem ij*s.* vij*l.* viij*s.* *(margin: Expense clerici elemosine)*

Domino Thome de Abyndon', clerico marescalcie, pro denariis per ipsum solutis diuersis pro expensis equorum diuersorum emptorum per diuersos dies antequam incipiebatur aula videlicet pro feno, auena, literia, ferrea, medicina equorum, cressetis, candelis, empcione diuersorum hernesiorum [f. 6 *d.*] et emendacione aliorum hernesiorum et necessariorum pro dictis equis, et pro vadiis diuersorum garcionum, valettorum, carectariorum, custodiencium dictos equos, ut patet per particulas per dictum clericum in garderoba liberatas, videlicet a vj die Aprilis usque xxv diem eiusdem mensis, utroque die computato, *xxij l. x s. vj d. ob. q.* Eidem clerico, pro denariis per ipsum solutis diuersis pro expensis quorundam equorum remanencium in custodia eiusdem clerici et pro vadiis garcionum custodiencium dictos equos, ab xj die Junii, quo die familia recessit, videlicet unusquisque ad propria usque vij diem Julii *cvj s. v d.* Eidem clerico, moranti London' ad compotum suum arrayandum et faciendum, et eunti ad curiam Regis ad tractandum consilio Regis super dicto officio marescalcie, pro expensis suis morando eundo et redeundo, a dicto xj die Junii usque tercium diem Julii, ultimo die computato, per xxij dies, percipienti per diem xviij*d., xxxiij s.* Summa xxix*l.* ix*s.* v*d. ob. q.* *(margin: Expense facte per clericum marescalcie hospicii domine A.)*

Summa a proxima summa ... xlix*l.* x*s.* vj*d. ob. q.* probatur.

Willelmo Hurtyn, maiori ville Douorre, Alexandro Hurtyn et Johanni Monyn, balliuis eiusdem ville, pro quinque nauibus et una bargea ab eisdem conductis pro passagio militum, dominarum, domicellarum, clericorum, et aliorum de familia Regis, veniencium de partibus Gerliensibus versus partes Anglie et ad curiam domini Regis euncium, per indenturam inter eosdem Willelmum Alexandrum et Johannem, et inter dominum Constantinum de Mortuo Mari, senescallum *(margin: Passagium familie domine Alienore sororis Regis in Angliam)*

hospicii dicte domine Alianore, dominum Robertum de Tong' thesaurarium, et dominum Johannem le Smale, contrarotulatorem eiusdem hospicii, factam apud Douorram, ix die Junii
xvij*l*. ixs. ij*d*.

Passagium Abbatis de Langedon' Domino Abbati de Langedon', pro passagio hominum et equorum suorum in Angliam, et pro custuma capitum hominum, equorum, hernesiorum, vallettorum suorum, apud Wythsand, et pro pontagio, portagio, batillagio, skippagio equorum, prout patet per particulas in garderoba liberatas, London', iiij die Julii
lxijs. v*d*.

Expense thesaurarii Domino Roberto de Tong', thesaurario hospicii domine Alienore sororis Regis Anglie, moranti Lond' ad compotum diuersorum officiorum audiendum et recipiendum, et eunti de ibidem usque Farnham domino Cancellario Episcopo Wyntoniensi, et de ibidem usque Wodestok' ad curiam domini Regis ibidem tunc existentem, et redeunti de ibidem usque London' per preceptum consilii Regis ad ordinandum circa vendicionem diuersarum rerum remanencium in garderoba dicte domine Alianore, pro expensis suis sic eundo, morando, redeundo et iterum morando, ab xj die Junii usque tercium diem Julii, utroque die computato, videlicet per xxij dies, percipienti per diem xs., per manus proprias, iij die Augusti
xj*l*.

Passagium magistri R. de Cantuaria Magistro Roberto de Cantuaria, pro passagio hominum et equorum suorum de partibus Francie usque Angliam, et pro custuma capitum hominum, equorum, hernesiorum, mallettorum apud Wytsand, et pro pontagio, portagio, batillagio, skippagio equorum, per manus domini Johannis cappellani sui, London', iiij die Julii
xxxjs. x*d*.

[Here is a cancelled entry of payment to John de Clisseby, 'moranti London' circa araycionem compoti diuersorum officiorum dicti hospicii . . .' The entry is marked in the margin 'examinatur'.]

Expense dextrarii Waltero Stedeman, moranti London' pro custodia j dextrarii vocati Cord' infirmati pro vadiis a xv die Julii usque xj diem Augusti, utroque die computato, capienti per diem ij*d*., per xxviij dies *iiij s. viij d.* Et pro expensis dicti dextrarii, videlicet pro feno per diem ij*d*., per tempus predictum *iiij s. viij d.* pro auena per tempus predictum iij p^c ij q^ar. di. j b₃. auene precii quarte iiijs. viij*d*., *xij s. iij d.* pro pane rewardo infra tempus predictum *vj d.* Et pro medicina facta circa eundem *iij s. iiij d.* ferratura *viij d.* lita *xij d.*
Summa xxvijs. j*d*.

[A cancelled payment to Robert de Tong', remaining in London ill, and for arranging and making his account. Note in the margin 'Quia alibi per breue post expensas. Respice in folio proxime sequenti post donis, videlicet in secundo folio'.][1]

f. 7   DONA

J. de Bristoll' nuncius Johanni de Bristoll', nuncio domine Alianore sororis Regis, de dono eiusdem domine ad quemdam equum sibi emendum, per manus proprias, xxviij die Aprilis, London'
xxs.

Diuersi menestralli Diuersis vidulatoribus, facientibus menestralcias suas coram cruce ad hostium boriale in ecclesia Sancti Pauli, London', de dono domine Alianore, ibidem, per manus thesaurarii, ultimo die Aprilis
xij*d*.

Cuidam menestrallo Cuidam menestrallo, facienti menestralciam suam coram domina Alianora in itinere suo inter Ospring' et Cantuariam, per manus domini senescalli, liberantis eidem denarios, iij die Maii   xij*d*.

M. de Romeseye Margarete de Romeseye, factrici lecti domine Alianore, venienti de London' usque Cantuariam et moranti ibidem cum dicta domina Alianora, et redeunti versus London', de dono eiusdem domine Alianore in subsidium expensarum suarum, apud Cantuariam, iij° die Maii, per manus proprias
xls.

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[1] A further marginal note reads 'summa totalis necessariorum'. The figures, however, are not entered.

Diuersis menestrallis, facientibus menestralcias suas coram ymagine Beate Virginis in volta in ecclesia Christi Cantuariensi, de dono domine, per manus thesaurarii, iiij^{to} die Maii   ijs.   Diuersi menestralli

Johanni de Bristoll', nuncio domine Alianore, de dono ipsius domine ad quandam pixidem de armis Anglie et Gelrie sibi emendam, apud Douorram, iiij^{to} die Maii, per manus proprias   xiijs. iiijd.   J. de Bristoll' nuncius

Magistro Ade le Ferur, ferratori domine Isabelle matris domine Alianore, venienti in comitiua eiusdem domine Alianore de Stratford atte Bowe usque Douorram cum curru et vij dextrariis, et reducenti eosdem dextrarios de Douorra usque Stratford atte Bowe, de dono domine Alianore, v^{to} die Maii, per manus proprias   xiijs. iiijd.   Diuersi de familia domine Regine Anglie

Johanni Clerico currerio domine Isabelle Regine matris domine Alianore, ducenti currum dicte domine Regine Isabelle usque Douorram, de consimili dono dicte domine Alianore, ibidem, eodem die, per manus proprias   xs.

Septem valettis, custodientibus dictos dextrarios, ibidem, eodem die, cuilibet vs., per manus J. le Clerc'   xxxvs.

Preequitatori, de consimili dono, ibidem, eodem die, per manus proprias   vjs. viijd.

Johanni de Deen, hostiario camere domine Philippe Regine Anglie, venienti cum domina Alianora et redeunti versus dictam dominam suam, de consimili dono eiusdem domine Alianore, ibidem, eodem die, per manus proprias   xiijs. iiijd.

Gerardo, hostiario camere domine Isabelle, sic venienti cum dicta domina Alianora, ibidem, eodem die   xiijs. iiijd.

iiij^{or} menestrallis, facientibus menestralcias suas coram domina Alianora venienti de mare usque Lescluses, de dono dicte domine, vj die Maii, per manus thesaurarii   xs.   Diuersi menestralli

Simoni de Sancta Elena, magistro nauis vocate Hurtyn et sociis suis seruientibus in eadem naui, de dono domine in subsidium expensarum suarum euntibus versus Angliam, vij die Maii, apud Lescluses, per manus Jacobi Sefoul, recipientis denarios ad deferendum eisdem, de domino thesaurario   xs.   Diuersi naute

Willelmo Rote, magistro bargee Andree Hurtyn et sociis suis nautis, de consimili dono domine   xxvjs. viijd.

Roberto Mold, magistro nauis Petri in qua domina Alianora passata erat, de consimili dono eiusdem   cs.

Waltero Baker, ductori eiusdem nauis Petri Bard, de consimili dono eiusdem domine Alianore xs.

Hugoni Priour, venienti nuncio domine Isabelle Regine Anglie venienti in Flandriam ad dominam Alianoram cum litteris dicte domine Regine, et redeunti versus dictam dominam suam, de dono dicte domine Alianore in subsidium expensarum suarum, vij die Maii, per manus proprias   xvs.   Nuncius domine I. Regine Anglie

Otelino Lalmaund, seruienti Regis ad arma, petenti subsidium domine Alienore de expensis equorum et hominum suorum morancium apud Bolon' per xv dies, dummodo idem Otelinus missus erat festinanter in partes Gerlie per preceptum domine Alianore, de dono eiusdem domine, vij^o die Maii   xls.   Otelinus Lalmaund

iiij menestrallis de Aragon', venientibus ad dominam Alienoram et facientibus menestralcias suas coram eadem, de dono eiusdem, per manus Henrici de Newenton', vij^o die Maii   xiijs. iiijd.   Diuersi menestralli

Quatuor mulieribus de Lescluses, cantantibus coram domina Alianora apud Lescluses, cuilibet earum iijs. iiijd., de dono eiusdem domine, vij die Maii, ibidem, per manus Thesaurarii   xiijs. iiijd.

Diuersi seruientes	Diuersis seruientibus in hospicio Jacobi Buk' burgensi (*sic*) de Lescluses, in quo domina Alienora et familia sua hospitabantur, de dono domine Alienore, prout mos est in patria illa, apud Lescluses, viij die Maii, per manus Copini Buk' recipientis denarios de Thesaurario ad deferendum eisdem vj*s*. viij*d*.
N. balliuus de Lescluses	Nicholao Barkyn, balliuo ville de Lescluses, eunti in auxilium diuersorum officiariorum ad diuersas prouidencias faciendas in villa predicta, de consimili dono eiusdem domine, per manus proprias ibidem x*s*.
Diuersi menestralli	Duobus menestrallis de partibus Hoyland', venientibus de Anglia usque Nouum Magium in comitiua domine Alienore, de dono eiusdem in subsidium expensarum suarum, viij die Maii, apud Bruges vj*s*. viij*d*.
	xiij menestrallis, tripudientibus et facientibus diuersas menestralcias suas coram domina Alienora, apud Bruges, x die Maii, per manus Johannis le Smale, de dono domine Alienore lx*s*.
Custos domorum Comitis Flandrie	Jacobo Dabyndon', custodi domorum comitis Flandrie in villa de Bruges in quibus domina et familia hospitabantur, de dono eiusdem domine, ibidem, x die Maii, per manus proprias x*s*.
R. palefridarius domine Regine	Reginaldo le Riene, palefridario domine Regine Philippe, presentanti domine Alienore unum palefridum badium vocatum Bayard de Burgh' ex parte dicte domine Regine, de dono domine Alienore nomine feodi sui, per manus Willelmi de Shirbourn', recipientis denarios apud Gaunt', xj die Maii vj*s*. viij*d*.
J. pagetti (*sic*) lardarii	Johanni Fox, pagetti (*sic*) lardarii domine Alienore, de dono domine ad calciamenta et socularia sibi emenda, apud Bruges, x die Maii, per manus proprias xx*d*.
Seruientes ad arma	Duobus seruientibus ad arma ville de Malyns, presentantibus domine Alienore ex parte dicte ville quatuor pannos longos de diuersis coloribus et quatuor dolea vini de Ryn, de dono eiusdem domine, apud Malins, xv die Maii, per manus eorundem xx*s*.
Quidam Baggepiper	Cuidam menestrallo vocato Baggepiper, obuianti domine Alianore in itinere suo et facienti menestralciam suam coram eadem, de dono domine, per manus proprias xij*d*.
Quatuor menestralli	Quatuor menestralli, tripudientes et facientes menestralcias suas coram domina, de dono domine, apud Malyns, xv die Maii, per manus Thesaurarii xx*s*.
Pagetti de camera	Quatuor pagetti de camera domine Alienore, de dono eiusdem domine Alienore ad calciamenta sibi emenda, apud Malyns, xv die Maii, per manus Willelmi de Corneuill' iij*s*. ix*d*.
W. Cardinal menestrallus	Willelmo Cardinal, paruo menestrallo domini Regis Anglie, venienti de Anglia ad partes Gerlie, de dono domine Alienore, apud Boscum Ducis, xvij die Maii, per manus Thesaurarii vij*s*. vj*d*.
Johanni Teysaunt'	Johanni Teysaunt', eunti de partibus Almannie versus dominum Regem Anglie, de dono domine Alianore in subsidium expensarum suarum sic eundo, ibidem, eodem die, per manus proprias xl*s*.
Diuersi menestralli	Diuersis menestrallis, facientibus menestralcias suas coram domina comitissa die quo desponsata fuerat, de dono eiusdem in communi, per manus Teysaunt', apud Nouum Magium xx*l*.
Quidam garcio	Cuidam garcioni, presentanti domine Alienore unum damum apud Rosyndale, xxiij die Maii, de dono domine Alienore, per manus Thesaurarii liberantis ei denarios vj*s*.
G. seruiens ad arma	Gydoni, seruienti ville de Arnham ad arma, presentanti domine Alienore vj dolea vini de Ryn ex parte hominum ville predicte, de dono domine, ibidem, eodem die x*s*. vj*d*.
Cortinus falconarius	Cortino falconario, presentanti domine comitisse vj esperuarios, de dono eiusdem domine Alienore, apud Rosindale, xxiij die Maii, per manus proprias xviij*s*.
Garcio cuiusdam domicelle	Cuidam garcioni Louete domicelle camere domine Alienore, petenti subsidium de domina Alienora de toto tempore quo ipse deseruauit eidem domicelle, de dono eiusdem domine Alianore, apud Nouum Magium, xxiij die Maii, per manus dicte Louette xiij*s*. iiij^{or}*d*.

Ricardo vidulatori, facienti menestralcias suas coram domina Alianora, de dono eiusdem domine et per preceptum eiusdem, apud Rosyndale, xxiij die Maii, per manus proprias   xij*d*.   f. 8
Quidam
vidulator

Nicholao Paumard, venienti de Anglia cum litteris domine Isabelle Regine Anglie ad dominam Alienoram, et redeunti versus dictam dominam suam Reginam, de dono eiusdem Alienore, apud Nouum Magium, xxvj die Maii, per manus proprias   xl*s*.   N. Paumard

Edmundo Hakelut', scutifero domine Isabelle Regine Anglie, petenti licenciam de domina Alienora eundi versus dictam dominam suam Reginam, de dono eiusdem domine Alienore, in subsidium expensarum suarum sic eundo, apud Nouum Magium, xxvij die Maii, per manus proprias   xl*s*.   Edmundus
Hakelut'

Willelmo de Corneuill', valletto de Camera domine Alienore, eunti in peregrinacionem apud Colon' ad Tres Reges, de dono domine in subsidium expensarum suarum, ibidem, eodem die, per manus proprias   xij*s*. iiij*d*.   Willelmus
Corneuill'

Jacobo Statyn, scutifero Comitis Flandrie, venienti in comitiua domine Alienore per preceptum eiusdem de Flandria usque Rosindale in partibus de Gerlia de dono domine Alienore in recessu suo versus partes Flandrie, ibidem, eodem die, per manus proprias   xxx*s*.   Jacobus
Statyn

Seruientibus in domo in qua domina hospitabatur apud Malyns, de dono eiusdem domine, prout moris (*sic*) est in patria illa, ut dicitur, ibidem, xxx^{mo} die Maii, per manus proprias   xj*d*.   Diuersi
seruientes

ADHUC NECESSARIA

f. 8 d

[Payment to John Bargeman and Richard Lovell, for a ship to transport the trappings of Eleanor's household. Cancelled *quia alibi titulo necessariorum*.]   *See* p. 130.

[Payment to Walter Stedeman for looking after the sick horse 'Corder'. Cancelled for the same reason.]   *See* p. 132.

[Cancelled payment to Robert de Tong'.]   *See* p. 124.

[Cancelled payment to John le Smale for staying in London to prepare his accounts. Note in margin *quia alibi per breue post summam*.]   *See* p. 131.

Anton' Bache, mercatori de Jenua, venienti in comitiua domine Alianore sororis domini Regis per ordinacionem ipsius domini Regis et consilii sui, ad inueniendum quamplures et diuersas res tam pro corpore quam pro camera dicte domine Alianore comitisse Ghelrie, pro expensis eius et garcionum suorum a primo die Maii usque xxv die eiusdem mensis, per xxv dies, utroque die computato, per compotum secum factum, Lond'   iiij*l*. ij*s*. x*d*.   A. Bache.
debet irro-
tulari inter
necessaria

Domino Roberto de Tong', Thesaurario hospicii dicte domine Alienore, pro vadiis suis et Johannis le Smale contrarotulatoris sui existencium et morancium London' pro compoto suo arraiando et faciendo, a vij die Augusti usque vj diem Octobris, per lxj dies, utrique eorum per diem x*s*., per breue directum Thesaurario et Baronibus et per consideracionem Baronum   lvj*l*.[1]   examinatur

[Cancelled payment to the same Robert and John, staying at York for forty days, rendering their accounts.]

Eidem Roberto, existenti et moranti apud Eboracum super reddicionem dicti compoti, per xl dies, capienti per diem x*s*., per breue Regis et per consideracionem Baronum   xx*l*.

Et Johanni de Brok', attornato dicti Johannis le Smale contrarotulatoris dicti Roberti, moranti apud Eboracum super reddicionem dicti compoti, per dictos xl dies, capienti per diem xij*d*., per consideracionem Baronum   xl*s*.[2]

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[1] Note in right-hand margin—*per consideracionem Baronum*.
[2] Note in right-hand margin, bracketing this item with the one preceding—*per consideracionem Baronum*.

f. 9

NUNCII

xvj die Aprilis, Johanni de Bristoll', nuncio domine Alienore sororis Regis, deferenti litteras ipsius Regis sub magno sigillo usque Douorram domino Willelmo de Clynton' constabulario Castri Douorre, pro nauibus prouidendis contra passagium dicte domine Alienore, pro expensis suis, London', per manus proprias   v*s.*

vj die Maii, Hauekino de Lescluses, misso usque Wytsand et Kaleys cum litteris senescalli, ad querendos equos domine ibidem existentes, pro expensis suis, ibidem, per manus proprias   iiij*s.*

ix die Maii, Johanni de Bristoll', nuncio domine Alianore, misso de Bruges usque Lescluses ad querendam garderobam robarum eiusdem domine, et de ibidem usque Bruges eandam Garderobam cariandam, pro expensis suis et cariagio eiusdem Garderobe, apud Bruges, per manus proprias   iij*s.*

viij die Maii, eidem Johanni, misso per dominum senescallum ad querendos dextrarios et palefridos existentes apud Neuport' cum summa festinancione, pro expensis suis, per manus proprias   iiij*s.*

xxvj die Maii, Johanni de Bristoll', misso de Nouo Magio usque Rosindale pro diuersis negociis per senescallum et familiam de domina habenda (*sic*), per manus proprias, apud Nouum Magium, pro expensis suis   xvj*d.*

xxvij die Maii, eidem Johanni, venienti de domina ad familiam de Rosendale usque Boscum Ducis et redeunte (*sic*) versus dominam Alianoram de ibidem usque Rosendale, pro expensis suis, per manus proprias   vj*s.* viij*d.*

xj die Junii, Willemo de Kent, misso de London' usque Clarindon' cum litteris senescalli pro diuersis negociis ad Curiam domini Regis ibidem tunc existentem habendis, pro expensis suis   v*s.*

xviij die Junii, eidem Willelmo, misso de London' usque Abyndon' pro litteris domini habendis et directis Magistro Roberto de Ayleston' Thesaurario Regis, pro solucione L*l.* facienda, pro expensis suis sic eundo   v*s.*

FEODA

f. 10

Dominus W. la Zousche	Domino Willelmo la Zousch' et domine Alienore uxori sue, euntibus in comitiua domine Alienore Comitisse Gerliensis sororis Regis Anglie per preceptum ipsius Regis et consilii sui, usque partes Gerlienses propter solempnitatem nupciarum eiusdem Comitisse, percipientibus de dicto domino Rege pro omnimodis expensis suis, preter passagium hominum et equorum suorum de Douorra usque Wytsand, per manus domini Johannis Haueslap', capellani sui, recipientis denarios in Garderoba dicte domine Alienore sororis Regis, London', xxviij die Aprilis lxx*l.*
Dominus Hugo de Audele	Domino Hugoni de Audeleye, eunti similiter in comitiua dicte domine Comitisse per preceptum eiusdem Regis et consilii sui, pro feodo suo quod percepit de dicto domino Rege causa supradicta, per manus domini Johannis de Kaylmerssh', capellani sui, et per litteram suam acquietancie, London', dicto xxviij die Aprilis lvj*l.*
Dominus J. de Crombwell'	Domino Johanni de Croumbewell', deputato per ipsum Regem et consilium suum ad interessendum in comitiua dicte domine Comitisse sororis Regis Anglie, pro consimili feodo suo quod percepit de eodem domino Rege, per litteram suam acquietancie, ibidem, die supradicto xlij*l.*

Dompno Abbati de Langedon', eunti cum dicta domina Alienora sorore Regis usque partes *Dominus* predictas causa supradicta, et moranti ibidem per aliquod tempus et eunti de ibidem usque *Abbas de* Comitem Hannonie, Ducem et Ducissam Brabancie, in negociis ipsius Regis, et venienti de *Langdon'* ibidem usque Curiam Regis tunc existentem apud Claryndon', videlicet ab ultimo die Aprilis usque xix diem Junii, per lj dies, percipienti per diem ij marcas, per compotum factum, London', cum fratre Henrico monacho suo, iiij die Julii   lxviij*l*.

Domine Margerie de Chaumpeyne, eunti in comitiua domine Alianore sororis Regis per pre- *Domina M.* ceptum eiusdem Regis et consilii sui causa supradicta, et venienti in Angliam ad Curiam Regis, *de Caump'* a xxij die Aprilis usque xj diem Junii, utroque die computato, videlicet per lj dies, percipienti per diem j marcam, per manus domini Willelmi capellani sui, London'   .   xxxiiij*l*.

Domine Burgee de Vallibus, eunti in dicta comitiua, et venienti similiter in Angliam ad Curiam *Domina* Regis, per lj dies, percipienti per diem j marcam, per manus Roberti filii sui, London'   xxxiiij*l*. *Burgea de* *Vallibus*

Domino Constantino de Mortuo Mari, senescallo hospicii domine Alienore sororis Regis, pro *Dominus* certo suo quod percipit de domino Rege pro omnimodis expensis hominum et equorum suorum, *senescallus* preter passagium dictorum equorum suorum, a xv die Aprilis, quo die venit London' pro arraia- cione familie dicte domine, et (*sic*) xxiiij diem Junii, quo die licenciatus erat de consilio Regis apud Wodestok', videlicet per lxxj dies, percipienti per diem j marcam, per compotum factum Nicholao de Thelnetham scutifero suo, et per manus eiusdem, London'   xlvij*l*. vj*s*. viij*d*.

Domino Galuano Corder militi, marescallo hospitatori hospicii domine Alianore, pro certo suo *Dominus G.* quod percipit de dicto domino Rege pro expensis suis una cum passagio suo, a iij die Aprilis, *Corder* quo die iter suum arripuit eundo versus partes Flandrie circa prouidencias ibidem faciendas contra aduentum domine Alianore, et (*sic*) vj diem Junii, quo die cepit licenciam eundo circa diuersa diuersa (*sic*) negocia sua propria, videlicet per lxiiij dies, percipienti per diem dimidiam marcam, per compotum secum factum, et per manus proprias   xxj*l*. vj*s*. viij*d*.

Magistro Roberto de Cantuaria, pro certo suo quod percipit de domino Rege pro expensis suis *Magister* similiter eundo in dicta comitiua, videlicet ab xj die Aprilis usque xiiij diem Junii, videlicet per *R. de* xlvj dies, utroque die computato, percipienti per diem xiij*s*. iiij*d*., per compotum factum cum *Cantuaria* domino Johanne capellano suo, Londoniis (*sic*)   xxx*l*. xiij*s*. iiij*d*.

JOCALIA EMPTA   f. 11 d.

Auntolino Bache, mercatori de Jenua, pro xxiiij nucheis firmaculis auri cum rubinis, bales[iis], emeraldis, grossis perleis orientalibus, emptis de eodem apud London' et Nouum Magium, xvij die Maii, per preceptum domine Alianore in presencia dominorum Edwardi de Bohoun, Willelmi de Monte Acuto, et domini Radulfi de Neuill' senescalli domini Regis, ibidem tunc existencium, et per auisamentum et consilium eorundem, ad dandum diuersis banerettis, militibus et aliis seruientibus in diuersis officiis, coram domina Alianora die quo solempnitas nupciarum inibi erat celebrata, sicut patet in proximo folio, precii pecie iiij*l*. iiij*s*.   c*l*. xvj*s*.

Eidem Anton', pro xviij alneriis de serico ad aurum, braydato de perleis, emptis de eodem ibidem, eodem die, per preceptum domine Alianore et in presencia dominorum predictorum, pro consimilibus donis dandis diuersis banerettis, militibus, et aliis seruientibus in diuersis officiis, coram domina Alianora die quo solempnitas nupciarum inibi erat celebrata, sicut patet in proximo folio, precii pecie xxxviij*s*. ix*d*. *ob*.   xxxiiij*l*. xviij*s*. iij*d*.

Eidem Anton', pro xvj zonis de serico de opere subtili, poudratis cum perleis, herniciatis de argento et auro amellato, emptis de eodem ibidem, eodem die, per preceptum domine Alianore

et in presencia dominorum predictorum, pro consimilibus donis dandis diuersis banerettis, militibus, et aliis seruientibus in diuersis officiis, coram domina Alianora die quo solempnitas nupciarum inibi erat celebrata, sicut patet in proximo folio, precii pecie xxiiijs. ijd.   xix*l*. vj*s*. viij*d*.

Eidem Anton', pro una zona cum filo auri bysecta, cum duabus paribus garteriis de secta, hernesciatis de argento deaurato et amellato, cum una bursa de Turkye de eodem opere, emptis de eodem ibidem, eodem die, pro consimilibus donis dandis per preceptum et ordinacionem ut supra   c*s*.

Eidem Anton', pro ij cultellis ad punctum, cum manubriis et vagena de argento deaurato amellatis et iuone[1] cisso et trussato, emptis de eodem ibidem, eodem die, pro consimilibus donis dando, per preceptum et cetera, et juxta ordinacionem supradictas (*sic*), precii pecie lx*s*.   vj*l*.

Eidem Anton', pro ij firmaculis auri cum ameraldis, rubinis, et bales[iis] assessis, emptis de eodem ibidem, eodem die, pro consimilibus donis dandis per preceptum et juxta ordinacionem supradictas (*sic*) precii pecie xx*s*.   xl*s*.

[The following are the persons to whom some of the above articles were given.]

f. 12

Domino Edwardo de Bohun Baneretto, consanguine domini Regis, venienti de partibus Anglie usque ad parte[s] Allemanie cum domina Alianora Comitisse de Gelria, et redeunti versus dictas partes Anglie post solempnitatem nupciarum eiusdem domine Alianore celebratam, de dono eiusdem, apud Nouum Magium, xvij die Maii.

Domino Willelmo de Bohoun, fratri suo, sic venienti et redeunti.

Domino Radulfo de Neuill', senescallo domini Regis.

Domino Willelmo la Zousche Mortimer.

Domino Johanni de Grey.

Domino Hugoni de Audeleye.

Domino J. de Croumbwelle.

Domino Johanni de Werdoun.

Domino Constantino de Mortuo Mari.

Domino Thome de Bradestan.

Domino Waltero de Mauney.

Domino . .,[2] baneretto de Allemania, scindenti in mensa coram domina die quo erat desponsata.

Domino . .,[2] baneretto de Allemania, seruienti domine de cipho eodem die.

Domino . .,[2] baneretto, assessori esce pro domina eodem die.

Domino . .,[2] senescallo domini Comitis Gelrie.

Domino . .,[2] camerario eiusdem Comitis.

Domino . .,[2] marescallo domini Comitis Gelrie.

Cuilibet unum nucheum auri cum ameraldis, bales[iis], rubinis, et grossis perleis, j zonam de serico de opere subtili cum perleis gernitam, de argento deaurato et amellato hernesciatam, et j alnerium de serico broudato de filo ad aurum, cum grossis perleis orientalibus, de dono domine per preceptum eiusdem et per consilium et auisamentum domini E. de Bohoun, domini Willelmi de Monte Acuto, et domini Radulfi de Neuill' se[3] senescalli hospicii domini Regis.

f. 11 d.

Eidem Anton', pro una zona de filo auri, hernesciata de auro, et garnita de grossis perleis orientalibus, et pro j bursa de filo ad aurum, consuta de opere subtili, poudrata de perleis grossis orientalibus, emptis de eodem pro consimilibus donis dandis ibidem, eodem die, per preceptum domine et in presencia dominorum juxta auisamentum et consilium eorundem, precii utriusque

         xxxiij*l*. vj*s*. viij*d*.

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[1] I am inclined to think that this means 'ebony' and not 'ivory', as the form 'ibenus' or 'ybenus' is often used. The transition from *b* to *v* is much easier than that from *r* to *n*.

[2] Name omitted in original.

[3] *Sic*. Evidently an attempt to write *senesc*' at the end of the line, and then an omission to cancel it.

[These were given to the following : (between the two sections is written *Et datum eodem die nupciarum*).]

Domino Willelmo de Monte Acuto, cum uno nucheo auri cum ameraldis, baleis, rubinis, et grossis   f. 12
perleis orientalibus, per manus domine Alianore, die quo erat desponsata.

Eidem Anton', pro ij bursis de serico et filo auri consutis, emptis de eodem ibidem, eodem die,   f. 11 d.
pro consimilibus donis dandis per preceptum domine et in presencia predictorum dominorum
juxta auisamentum et consilium eorundem, precii pecie xs.   xxs.

Summa ccij*l.* vij*s.* vij*d.*

Hildebrando Soudreman, pro ij zonis de serico ad aurum, hernesciatis de argentato (*sic*) deaurato
et amellato, garnitis de perleis, emptis de eodem ibidem, eodem die, pro consimilibus donis
dandis diuersis banerettis, militibus, et aliis seruientibus in diuersis officiis, coram domina Alia-
nora die quo solempnitas nupciarum inibi erat celebrata, sicut patet in proximo folio   xxxiiijs.

Summa xxxiiijs.

[Below the remaining details of presents of jewels, &c., are given.]

Domino Nicholao de la Bech'.	Cuilibet j nucheum auri, cum rubinis, ameraldis, f. 12
Domino Radulfo de Hastang'.	et grossis perleis, de dono domine, per pre-
Domino Radulfo de Croumwell'.	ceptum eiusdem et per consilium et auisa-
Domino Willelmo de Cusaunce.	mentum domini E. de Bohoun, domini Willelmi
Magistro Johanni Moliard' canonico Arramensi	de Monte Acuto, et domini Radulfi de Neuill'
Thesaurario domini Comitis Gelrie.	senescalli hospicii domini Regis.
Magistro Isamberto, clerico eiusdem comitis.	

Johanni Teysaunt, menestrallo Regis, de dono domine unam zonam de serico hernesciatam de
argento et auro amellato, et unam alneriam de serico consutam, de dono domine, per preceptum
eiusdem et per consilium et auisamentum domini E. de Bohoun, domini Willelmi de Monte Acuto,
et domini Radulfi de Neuill' senescalli hospicii domini Regis.

In oblacione ad feretrum sancte Thome Martiri, j nucheum auri

Summa jocalium datorum	Nucheorum et firmaculorum	xxiij.
et oblacionis ut patet	Alneriorum et bursarum	xix.
supra	Zonarum	xix.
	ij burse in precio	xxs.
Jocalia vendita super	j zona, cum uno pari garteriorum de secta bisectorum, cum j bursa	
compotum	de Turkye in precio	cs.
	ij cultelli ad punctum, cum manubriis et vagena de argento deaurato	
	et amellato, et de iuone grauato, in precio	vj*l.*

Examinatur.

Recepte diuersarum rerum sine precio.   f. 12 d.

De magistro Willelmo la Zousch' clerico Magne Garderobe domini nostri Regis, pro solempnitate   Recepta
nupciarum domine Alianore sororis Regis Edwardi tercii, in anno regni eiusdem vj°, videlicet tam
pro corpore eiusdem domine quam pro camera, aula, garderoba, et aliis diuersiis officiis hospicii
eiusdem domine Alianore, prout patet per particulas contentas in quadam indentura confecta inter
dictum magistrum Willelmum et dominum Robertum de Tong', thesaurarium hospicii domine
Alianore, cuius alteram partem indenture dictus Robertus liberauit ad scaccarium domini Regis
apud Westmonasterium super compotum suum   De quibus

Idem Robertus computat liberasse domino Comiti Gelrie omnes particulas contentas in dicta   Exitus et
indentura apud Nouum Magium, xxiij Maii, preter diuersas res expenditas in hospicio dicte   liberacio
                                                                                            earundem

domine Alianore sororis Regis Anglie, ut patet in margine magni rotuli expensarum dicti hospicii, et preter diuersas res venditas diuersis hominibus ad diuersa precia, ut patet inter receptam libro isto, titulo de eadem recepta.

Recepte equorum

Recepte equorum	De magistro Roberto de Ayleston', Thesaurario Regis	viij dextrarii
	De eodem magistro Roberto, Theaurario Regis	j palefridus
	De eodem magistro Roberto, Thesaurario Regis	xij somerii
	De eodem magistro Roberto, Thesaurario Regis	viij equi carectarii
	De empcione per Robertum de Tong', ut patet libro, titulo de necessariis	vij somerii
	De equis venientibus cum eadem domina Alianore, videlicet	v dextrarii
		vj palefridi
		ix equi carectarii

Summa equorum receptorum   lvj.   De quibus

Exitus equorum Idem Robertus de Tong' computat liberasse domino Comiti Gelrie xj dextrarios. Et j dextrarium caruannum datum cuidam hospicio sancti Johannis de Jerosalim apud Nouum Magium, xxj die Maii. Et j dextrarium liberatum domino episcopo Wyntoniensi apud Cantuariam, iij die Maii, de dono dicte domine Alianore ante transfretam suam versus partes transmarinas

Summa dextrariorum xiij dextrarii

Item : idem computat liberasse Henrico de Lancastre, per preceptum dicte domine Alianore apud Bruges, j palefridum nigrum grisellum de Ispania. Idem computat liberasse cuidam militi pro feodo suo, die quo dicta domina erat desponsata, j palefridum. Idem computat liberasse per preceptum dicte Alianore tribus domicellis camere sue euntibus versus Angliam, de dono eiusdem, videlicet Johanne de Seynton' j palefridum ; Matild' (*sic*) de Wilmynton' j palefridum ; et Ene de Wilmynton' j palefridum. Item liberauit domino comiti Gelrie apud Rosendale ij palefridos. Summa palefridorum vij. Idem computat liberasse Otelino Lalamand, de dono domine, apud London', ultimo die Aprilis, ante transitum eiusdem domine Alianore versus partes transmarinas, j somerium. Item liberauit domino comiti Gelrie vj somerios. Et dicta domina dedit diuersis seruientibus de familia sua euntibus versus Angliam, videlicet Nicholao Touk' elemosinario j somerium ; domino Nicholao de Barneby capitali capellano j somerium ; Johanni Perot' j somerium ; Hugoni Burglion j somerium ; Johanni de Clisseby j somerium. Et in morina apud Nouum Magium j somerium. Summa sumeriorum xiij. Idem computat liberasse vj equos carectarios domino comiti Gelrie. Et dicta domina dedit Ricardo Fisshere currario suo j equum carectarium ; et begine de Malyns j equum carectarium caruannum.

Summa equorum carectariorum.   viij equi.

Summa equorum liberatorum videlicet	Dextrariorum	xiij
	Palefridorum	vij
	Someriorum	xiij
	Equorum carectariorum	viij

Et remanent	Someriorum	vj
	Equorum carectariorum	ix

Venditi postea diuersis ad diuersa precia libro isto inter receptam titulo de recepta.

Fig. 1. Deerhurst church from SW. before the 1861 restoration

Sidney Pitcher, A.R.P.S., Gloucester, photo.

Fig. 2. Deerhurst church from SW. as at present

V.—Deerhurst Priory Church : including the result of the excavations conducted during 1926. *By* W. H. KNOWLES, F.S.A.

Read 10 March, 1927

THE priory church of Deerhurst is situated on the northern boundary of Gloucestershire, two miles south of Tewkesbury. It stands within 250 yds. of the river Severn, on low land still liable to flood. The village is part of a strip of country bounded on the west by the Severn and on the east by a road, both of which afford direct communication between the cities of Gloucester and Worcester. Nearer the river was an ancient trackway between these places, passing through Deerhurst and Tewkesbury. Malvern Chase extended from the right bank of the river to the hills beyond. Deerhurst lay in that division of the kingdom of Mercia known as the land of the Hwiccas, which included a considerable tract of country now forming part of the counties of Worcester, Gloucester, and Warwick.

It is known that there was a monastery at Deerhurst soon after 804 [1] and that it was richly endowed and of more importance than Tewkesbury.[2] The church is stated to have been destroyed by the Danes, presumably before their activities in Mercia ceased in the first half of the tenth century. In 970, during the Christian revival of King Edgar, Oswald, bishop of Worcester, installed Benedictine monks at the place.[3] Alphege (954–1012), bishop of Winchester (984–1006) and archbishop of Canterbury (1006–1012), took the monastic habit at Deerhurst.[4]

About 1059 the greater part of the possessions of the priory was granted by Edward the Confessor to the abbey of Saint-Denis, near Paris, and Deerhurst thus became an alien priory. The first monk from Saint-Denis who became a prior was Baldwin, afterwards, in 1065, abbot of Bury St. Edmunds. In 1069 William the Conqueror confirmed the possessions.[5] At the time of the Domesday survey the lands of Saint-Denis in Gloucestershire amounted to sixty-four hides, and included the vills of Uckington, Staverton, Coln St. Denis, and

[1] Dugdale, *Mon.* i, 591, no. xxiii.
[2] Smaller conventual houses occur at Evesham, Pershore, Ripple, Tewkesbury, Gloucester, Winchcombe, and Bredon.
[3] *Bristol and Glouc. Trans.*, xviii, 125.
[4] Ælfheah, *Dictionary Nat. Biography*, i, 150.
[5] Doublet, *Histoire de l'Abbaye de Saint-Denis*, 839.

Caldicote, Little Compton, Preston-on-Stour, and Welford, besides thirty burgess-tenements in Gloucester.[1]

Only the Saxon features of the church will be examined here. They are of considerable interest and importance, and in extent comparable with any extant English church of the same antiquity. It is one of a group of some dozen churches in the county, including Coln Rogers, Bibury, Daglingworth and others, in which work of the Saxon period can be traced.
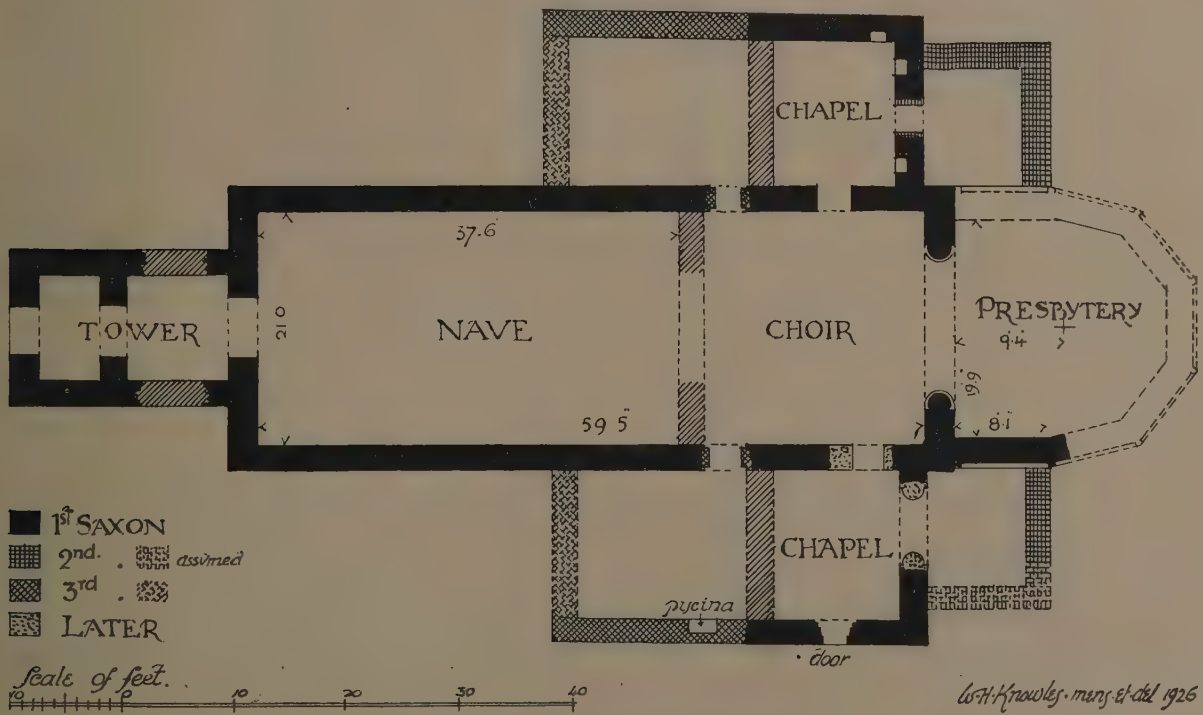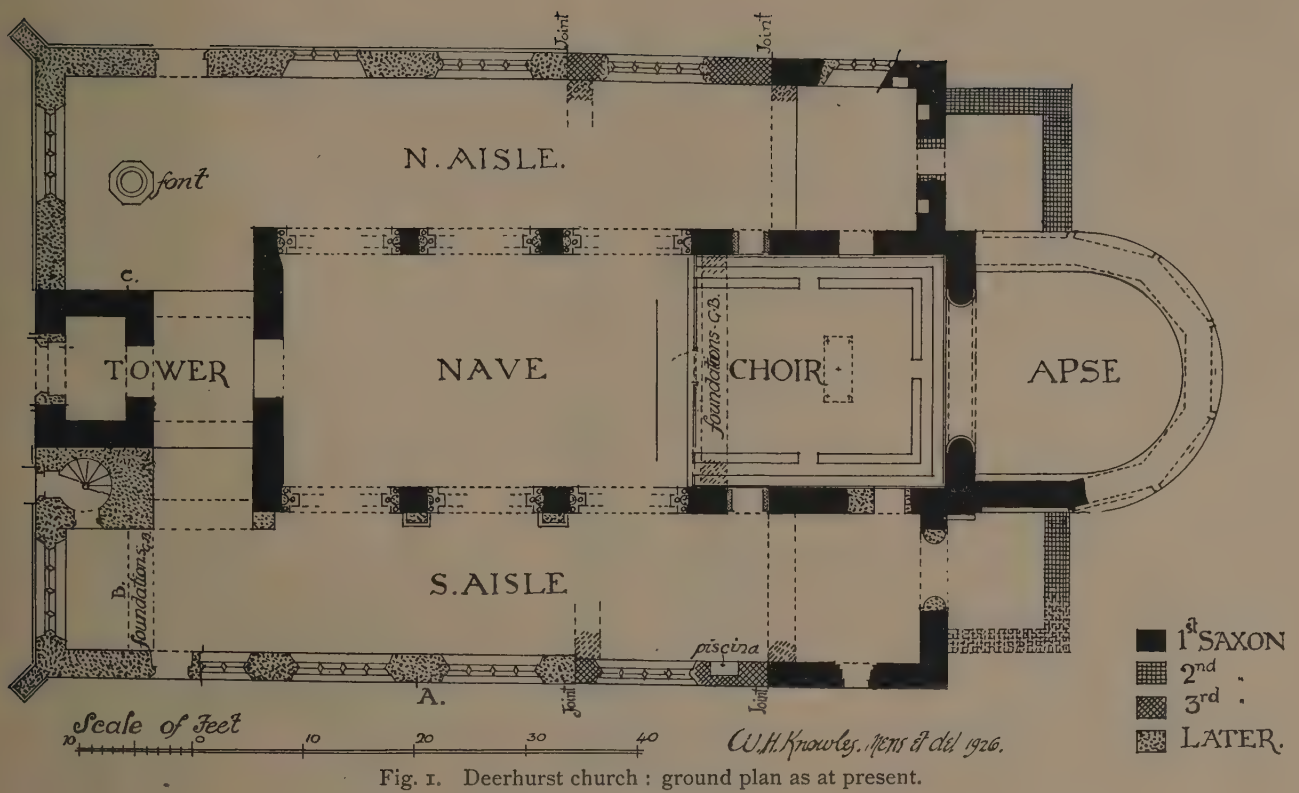
Unlike the recognized development of Gothic work, Saxon buildings do not exhibit pronounced details of definite progression. Notwithstanding the close study which the subject has received during the past half-century, it is yet difficult to assert with certainty the precise date of the erection of many examples, and so far a tentative understanding only has been reached as to which structures may be assigned to the earliest, the latest, or to an intermediate period.

The plan of the existing priory church of Deerhurst (fig. 1) consists of a western tower, a clerestoried nave of three bays, a quire, and north and south aisles. The tower, nave and quire, and the eastern portions of the aisles are of the Saxon foundation. The original plan (fig. 2) comprised an apsidal presbytery, a quire flanked by chapels now incorporated in the aisles, and an oblong nave with a western tower. The whole plan approximates to that of a cruciform church.

The site of the apse and its side chambers, which was previously overbuilt by farm buildings, was recently acquired, enclosed and vested in trustees, and the site excavated by the writer. The precise plan of the eastern arm of the church was definitely determined, other investigations were made, and the existing Saxon walling forming the south side of the square bay of the apse was repaired. It is not intended to report the work of the excavations separately but to incorporate the result in the story of the fabric.

The Saxon walls are 2 ft. 3 in. to 2 ft. 6 in. in thickness, of oolitic limestone roughly built on both faces in courses averaging 4 in. in height with comparatively wide joints, the walls of the lower stages of the tower being of ruder workmanship than elsewhere. Throughout there is an exceptional quantity of 'herring-bone' work. There are no quoins to the angles of the Saxon structure except where the pilaster work occurs about the apse. The jambs of the doors and windows are formed in large stones, usually the width of the wall in which they occur. The larger openings are spanned by arches.

[1] *Dom. Bk.* (Rec. Com.), 166 [*V. C. H.*]. 'Alone among the churches of Gloucestershire it [Deerhurst] had been powerful enough to collect all its estates into a single hundred, and to call that hundred by its own name.' The share which the Confessor gave to Westminster equalled 59 hides : that of Deerhurst (St. Denys) 64½ hides, with a modern acreage of 16,015 and income £30. *Bristol and Glouc. Trans.*, xxv, 232.

N. AISLE.

font

TOWER   NAVE   CHOIR   APSE

Foundations G.B.

C.

D. foundations E.B.

S. AISLE

piscina

A.

Joint   Joint

Joint

Scale of feet

10   0   10   20   30   40

W.H. Knowles. mens et del 1926.

■ 1ˢᵗ SAXON
▦ 2ⁿᵈ .
▨ 3ʳᵈ .
▩ LATER.

Fig. 1. Deerhurst church : ground plan as at present.

CHAPEL

TOWER   NAVE   CHOIR   PRESBYTERY

37.6

21.0

59.5

9.4

19.9

8.1

CHAPEL

piscina

door

■ 1ˢᵗ SAXON
▦ 2ⁿᵈ . ▩ assumed
▨ 3ʳᵈ . ▨
▩ LATER

Scale of feet.

10   0   10   20   30   40

W.H. Knowles. mens et del 1926

Fig. 2. Deerhurst : plan of Saxon church.

It will be convenient to begin the description of the building at the west end, as the tower has suffered less alteration than the other members of the church. The tower (fig. 3) measures on the exterior 21 ft. 6 in. from north to south,

WEST ELEVATION   TOWER LOOKING EAST   WEST END OF NAVE

W.H. Knowles. mins st del. 1926.
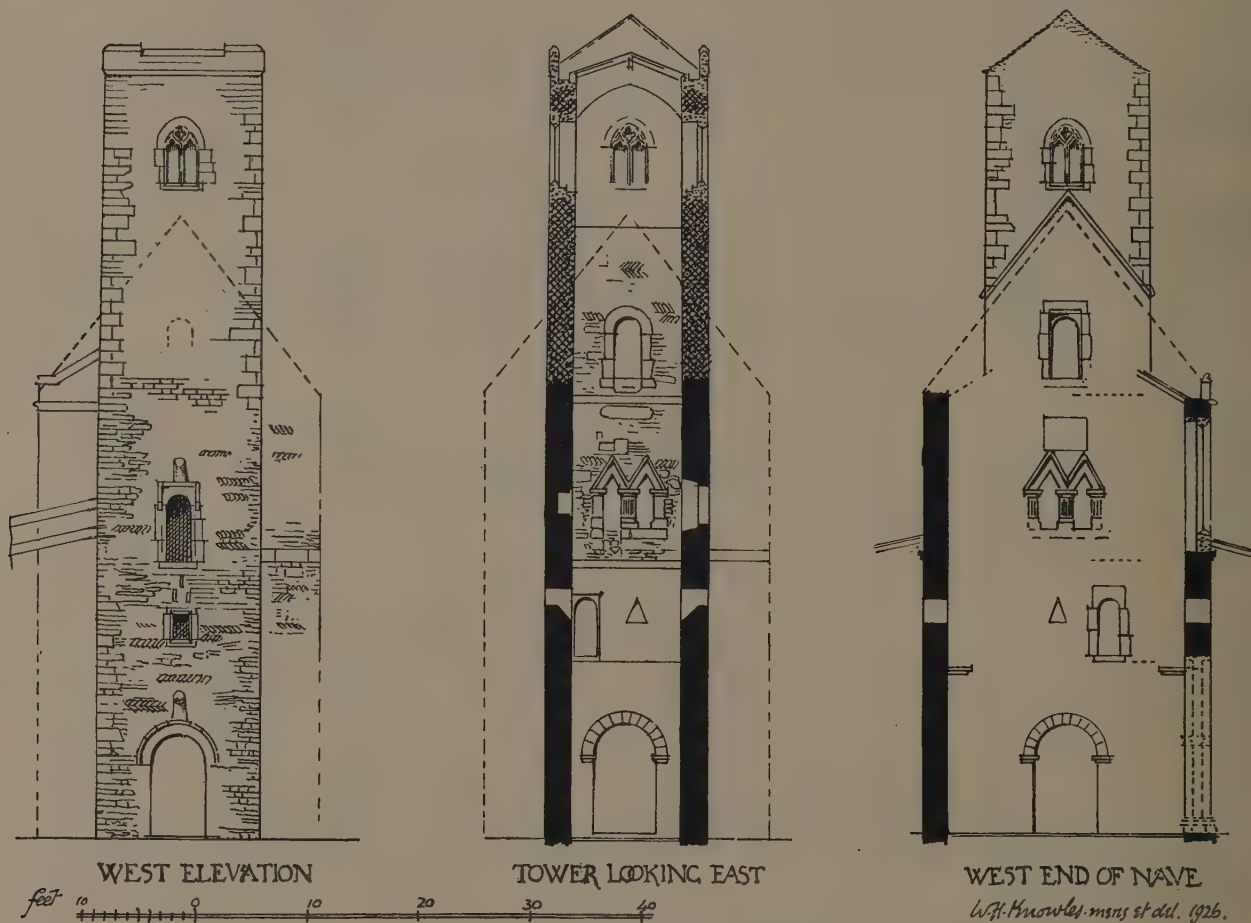
Fig. 3.   Deerhurst church : Tower elevations.

and 14 ft. 6 in. from east to west.   It is 71 ft. in height, unbroken by strings or offsets, and without quoins to the extent of about half the height.   The walls of the upper portion are slightly battered, the angles are enclosed by quoins, and on the interior there is a distinct difference in the character of the walling, which further shows no 'herring-bone' work.   This is a combination of facts which must be taken to indicate a pause in the building operations, but is scarcely sufficient proof that there was at first a porch which was afterwards carried up and became a tower, as occurred at Monkwearmouth, Corbridge, and Brixworth (fig. 19).
    On the exterior the flat surface of the tower is relieved only by a small

square-headed window over the entrance, the door-like opening at the third stage level, and by small square-headed windows, two in the north and two in the south walls. Below the parapet are two-light fourteenth-century windows in each face.

On the interior, the tower now comprises five floors, the uppermost being the belfry. At the ground-level it is divided by a mid-wall into two unequal
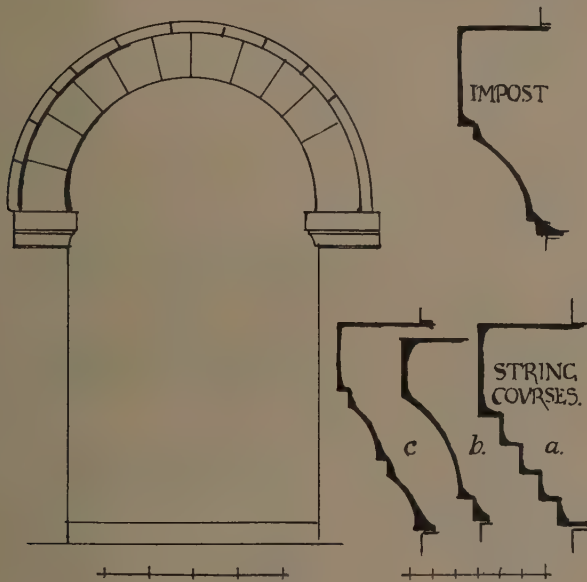

Fig. 4. Opening in east wall of tower (nave gable).

Fig. 5. Beast's head over west tower door.

sections.[1] The north and south walls of the larger section, adjoining the nave, have been removed to afford access to the aisles. The west, the mid, and the east walls are pierced by semicircular openings of different heights (fig. 3). That in the east wall (the nave gable, figs. 3 and 4), is of square-edged voussoirs with ashlar soffit enclosed by a thin square label to the porch. The arch springs from an impost with a square abacus and slightly hollowed chamfer, having a square fillet above and below which is returned on each face of the wall. The opening has a clear width of 5 ft. 6 in., and is 7 ft. from the floor to the top of the impost.

The external opening (fig. 3) has been altered to receive a fourteenth-century pointed arch, but there are yet remains of portions of the Saxon voussoirs and a square label, and above it a large projecting beast's head (fig. 5), much mutilated and difficult to classify. It is an unusual conception of Scandinavian inspiration, and is to be associated with other beasts' heads mentioned below.

[1] I removed the plaster at the point 'C' (fig. 1) to ascertain if the porch were first built of the oblong shape, or only of the size of the eastern section, but found no straight joint in the masonry.

The mid-wall opening is a modern construction with beasts' heads (fig. 6) incorporated as terminations to the label mould. They are fairly well designed and executed, and will be more particularly referred to hereafter.[1]

Above the opening and on its west face is a tall narrow panel (fig. 7) 3 ft. 7 in. by 1 ft. 4 in. on which is a nimbed figure, much mutilated and over-

Fig. 6.   Label termination, mid-wall of tower.

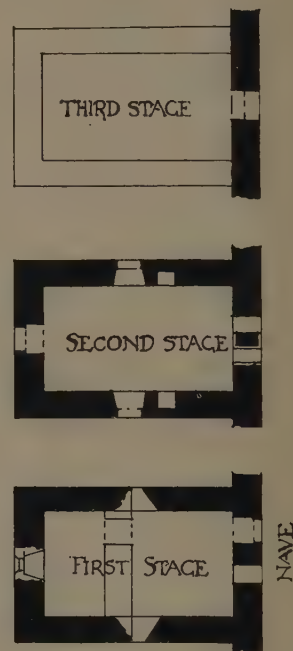Fig. 7.   Nimbed figure, mid-wall of tower.

Fig. 8.   Plans of upper floors of tower.

chiselled. It is probably in its original position, although it occurs over the modernized door opening.

The floor above (the second stage) is divided by a mid-wall which is not contemporary but an early introduction. It is without 'herring-bone' and covers the western splayed jamb of the small loops which lighted the chamber on the north and south sides. The small square window in the west wall no doubt took the place of an original one.

On the east wall of the tower (the nave gable) is a small semicircular-headed door with a square lintel to the rear, supported on inclined jambs, 1 ft. 9 in. to 2 ft. 1 in. wide and 5 ft. high to the crown of the arch, which opened on to

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[1] *Deerhurst: A parish of the Vale of Gloucester*, by the Rev. Geo. Butterworth, ed. 1887, p. 42, who remarks : ' This ornament [beasts' heads] I ought to observe, as one who sanctioned the present arrangement, is not in its original position.'

a possible ladder or gallery at the west end of the nave (fig. 3). Near it is
a triangular-headed opening formed in the walling and plastered on the soffit.
It is 22 in. high by 16 in. wide at the base.

The third or middle stage of the tower possesses features of exceptional

W. DOOR EXTERIOR   SECTION   INTERIOR.

NORTH   SIDE   E. SIDE

W.H. Knowles. mens et del 1926

Fig. 9.   Middle stage of tower : details.
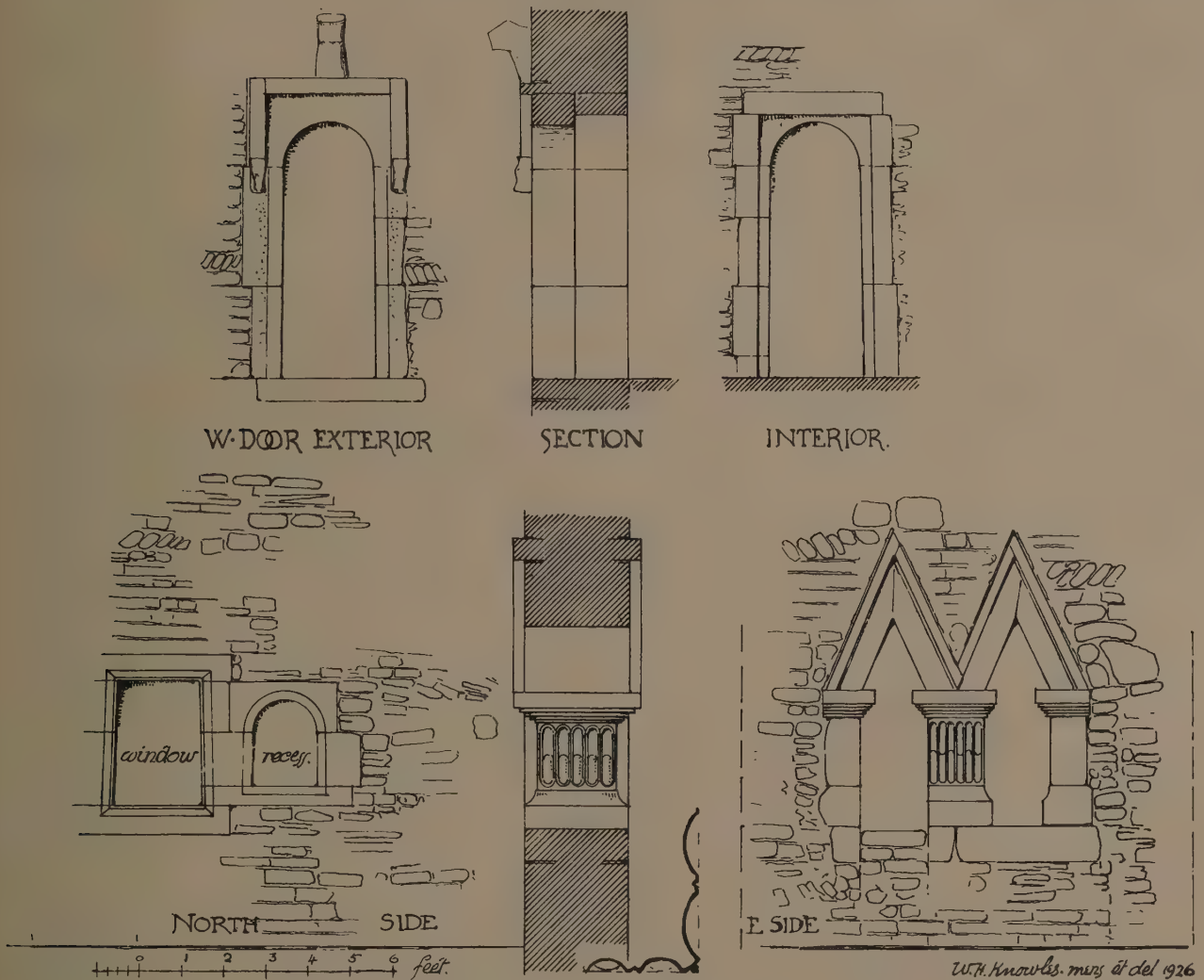
design and execution, which give the chamber particular interest (figs. 3, 8, and
9). At the west end is a door-like opening, 2 ft. 3 in. wide and 6 ft. in height to
the crown of the arch, which is worked in a single stone, and has a square
lintel to the rear, supported on inclined rebated jambs (fig. 9). The arched
stone is wrought square on top with a square label resting on small beasts'

heads. Above the opening is one of the large grotesque animal heads resembling that on the entrance below.[1]

On either side the chamber is lighted by square-headed windows with inclined jambs, all rebated and splayed as shown on the detail. Alongside is an arched recess, 19 in. high by 23 in. wide, rebated on the angles.

In the east wall is the elaborate double opening familiar to all students (fig. 9). A broad sill, the thickness of the wall, supports a short pier which is irregularly and rudely fluted (six on the narrow and five and seven on the wide sides), and indiscriminately reeded in the upper and lower portions of the flutes. The jamb stones have three flutes to the nave and one only on the return. The base to the short pier is moulded with a hollow chamfer, and the cap and imposts with a series of small oversailing fillets below a square abacus. The triangular heads, in two stones the thickness of the wall, are enclosed with sloping rebated square hoods. One of the openings has been cut down to the floor-level at a later date, affording access to the gallery below by means of a ladder.

On the interior of the nave is a large square stone above the double opening. It is without carving, nor is there any evidence of a painted inscription, if such ever existed.

Except in the nave gable wall, the herring-bone style of walling is discontinued at the ceiling-level. Above this point are a few courses of rough ashlar, and then inferior walling composed of very thin rag stones (section fig. 10), indicating a difference in technique between the upper and lower portions of the tower. On the exterior (fig. 3) are similar courses at the same level.

In the chamber of the third stage is a semicircular-arched opening, 2 ft. 7 in. wide by 5 ft. 6 in. high, with a square lintel to the rear. It is in the west gable of the nave, at the level of its roof tie-beams (figs. 3 and 8).

The walling on three sides of the tower at this level and upwards, of slightly different character, is enclosed by quoins on the external angles. For a considerable distance it is without windows or other features; it was altered or

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[1] Mr. J. T. Micklethwaite, in his excellent paper on 'Something about Saxon Church Building' (*Arch. Journ.*, liii, 293), suggests that doors in this position opened on to chambers built against the tower. At Monkwearmouth there is much to support this assumption; but at Barnack and Earls Barton openings occur on all sides and at several levels, and could not have been intended for communication with buildings. Moreover, the strangely ambitious effort at decoration covering the wall surfaces at these places is inconsistent with the idea that the achievement was so enclosed. At Deerhurst Mr. Micklethwaite indicates a baptistry at the west end, but I probed the area and did not find a single stone to warrant the suggestion. Furthermore, the character of the details on the west side of the tower are appropriate only to an external elevation. The upper door-opening might very fittingly be used for ventilation, the windows of the church being small and unopenable, and it would also be convenient for the admission of articles.

heightened in the fourteenth century, when traceried windows were inserted below the parapet (fig. 3).

The nave is 21 ft. in width; to the destroyed west wall of the quire it is 37 ft. 6 in. in length, and to the east wall, 59 ft. 5 in. (fig. 2). To the eaves it is 39 ft. high from the floor, an exceptional height for a church of its size.

The evidence for the west quire wall is recorded by the Rev. G. Butterworth,[1] who was vicar during the restoration of the church in 1861. At this time the foundations below the floor were laid bare, and the position noted on the wall face on either side of the nave, where the cross wall reaching from floor to ceiling had been removed.[2]

The Saxon masonry containing courses of herring-bone work exists to the eaves level (fig. 3), and the slope of the roof of the nave is indicated by the weather-moulding on the east wall of the tower.

Among the contemporary features to be observed are two pieces of a hollow chamfered string-course on the west wall, a little below the level of the sill of the small round-headed door which opens from the first stage of the tower (fig. 3). If this door opened on to a gallery, the string-course may have been continued along the nave wall (now pierced by the thirteenth-century arcade) for a distance equal to the projection of the gallery. Galleries in a like position have been suggested at Dover, Bosham, Jarrow, and Brixworth. In some instances they seem to have had a considerable projection, and possibly served a special purpose. In this connexion the small triangular opening must be remembered—if its object was to give facility for observation of the church below. Its usefulness would be lessened as the projection of the gallery increased.

At the same height from the floor, in both of the nave walls and mid-way in their length, are similar triangular-shaped openings (fig. 10). They are not framed in dressed stones, as are the other openings in the church, but rudely formed by oversailing the walling stones. It may, therefore, be fairly questioned whether they represent intentional openings.

On the exterior of the nave walls, at 25 ft. above the floor, is a much mutilated stone string-course of square stepped members (figs. 4 a and 11). It is returned round the west gable and finishes against the tower, and is continued for a short distance along the quire walls. Considering the distance above the floor-level, it occurred to me that the moulding might have formed the cornice

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[1] G. Butterworth, *Deerhurst: A parish of the Vale of Gloucester*, ed. 1887, *op. cit.*, p. 51. He also mentions (p. 48) that 'Apparent fragments of this arch were found (1861) in the high archway formed in the south wall of the quire, and also (I believe) in doorways then, but not now, entirely blocked up'.

[2] The nave walls were pierced for the arcade of three bays in the early thirteenth century (figs. 1 and 10).

of a possible church of this height, but on removing the plaster below, on the chance of finding evidence of windows or arcading such as does exist in the like position at Geddington church in Northamptonshire, I found the wall-surface

WEST SIDE OF S.CHAPEL · AA →

S.Aisle.   S.chapel

S. ELEVATION OF APSE

NAVE   CHOIR   APSE

W.H. Knowles.
meas et del 1926

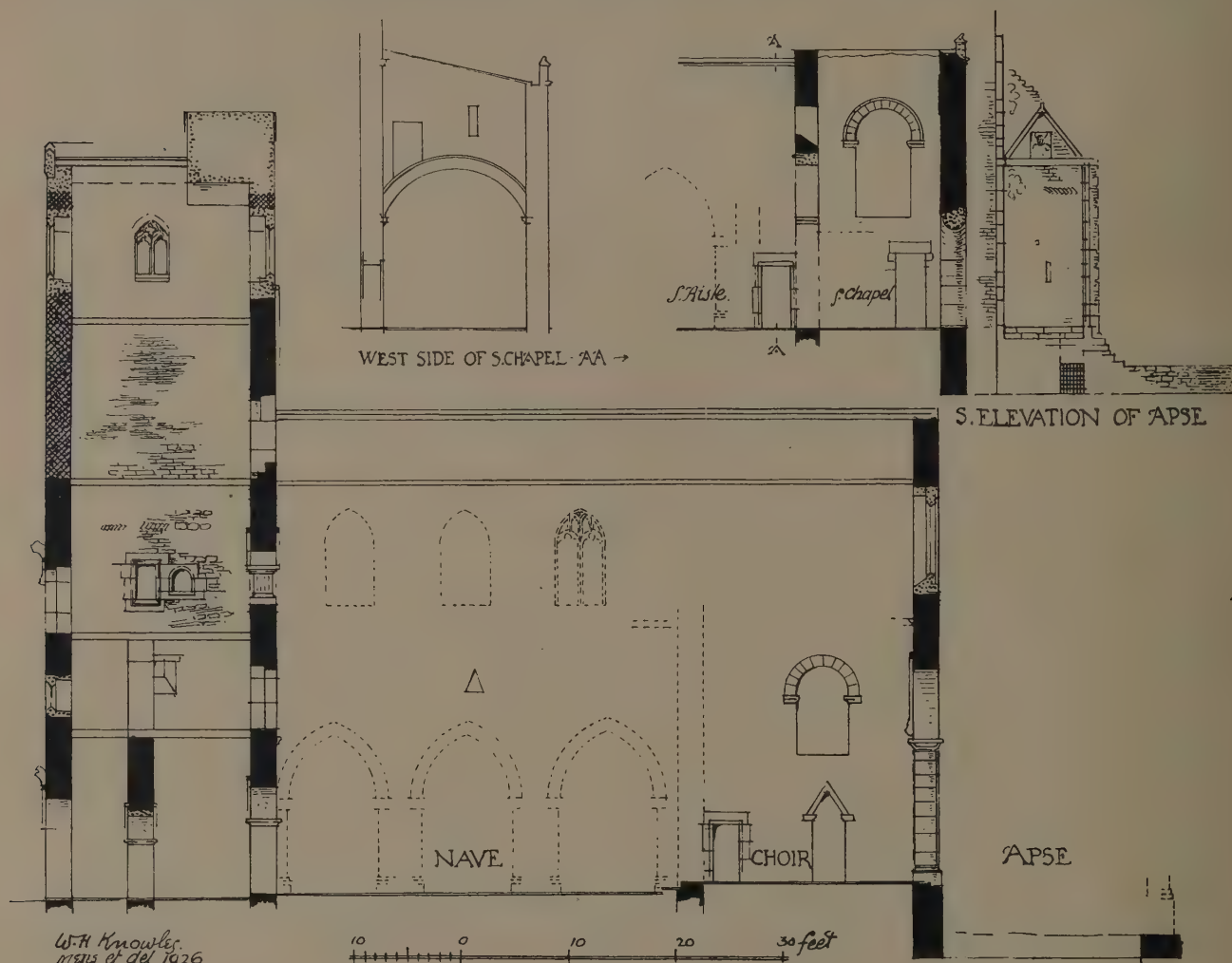10   0   10   20   30 feet

Fig. 10.   Deerhurst: longitudinal section.

unbroken.   It is therefore clear that the moulding is to be regarded as a string-course placed below the windows, which must have occupied the same position as those in the present clerestory, between which undisturbed masonry with herring-bone courses still survives on the south side.

Before leaving the nave it should be mentioned that there is no evidence to indicate contemporary aisles. The testimony to the contrary is to be observed in the definite and complete plan of the south chapel flanking the quire, and in the erection in Saxon times of another chapel to the west of it, overlapping part
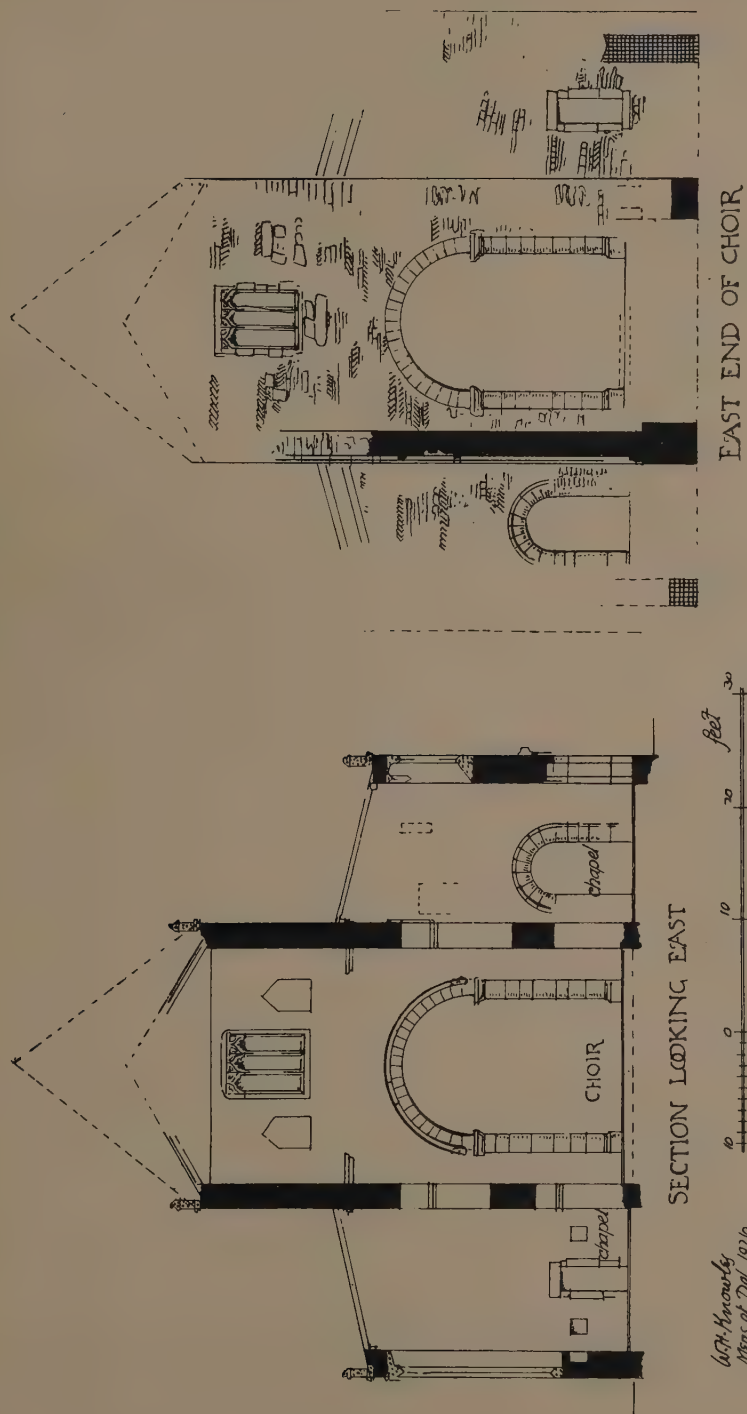
SECTION LOOKING EAST

CHOIR

chapel

chapel

W.R. Harcourt
Meas et Del 1926

EAST END OF CHOIR

Feet

Fig. 11. Deerhurst: east end, section and elevation.

of the nave wall to the extent of 11 ft. (fig. 2). This is clearly defined as to its length by the quoinless straight joint indicating the external angle of the chapel, against which the later thirteenth-century aisle wall was built[1] (fig. 1).
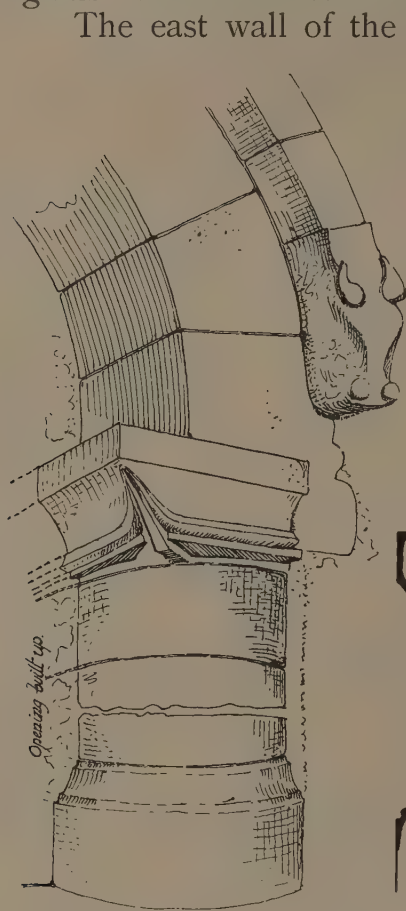
The east wall of the quire (fig. 11) is pierced by a large semicircular arch opening into the presbytery, 12 ft. in width and 13 ft. 2 in. to the top of the capitals. It is of a single square-edged order within a heavy square label terminated by beasts' heads of inferior design (fig. 12), which have suffered greater damage than the smaller ones mentioned above. The arch, supported on half-round jambs with a hollow moulded base, springs from capitals of unique character formed of a square abacus over a slightly hollow bell, divided by a rib which projects from the bed of the cap and tapers to the angle of the abacus. It is a clumsy method of effecting the transition from the round to the square. In place of the usual necking are two fillets, the lower one square-edged abutting on the rib, the other angular up-turned by the side of it.

Fig. 12. Chancel arch and respond.

In the gable, about 30 ft. above the floor, is a three-light fifteenth-century window, and below its sill is a large stone visible on the exterior (fig. 11) which suggests an opening communicating with the presbytery roof and corresponding with that in the west gable. Within, on either side of the window, are square-sided tablets of stone with pointed tops intended for inscriptions, unless they indicate openings of which there is a suggestion in the odd stones seen on the exterior. Yet if they were openings, they were not for light as they occur below the level of the apse roof. Two pieces of moulded string (fig. 4 b and c) will be noted on the interior elevation (fig. 11) at the precise level of the stepped strings on the exterior of the nave walls.

Whether the quire at Deerhurst was carried up above the adjoining roof in the form of a tower is problematical. The walls are not increased in thickness for such purpose, but neither at Dover nor Breamore are the tower walls thicker

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[1] At 'A' (fig. 1) is a partial straight joint in the thicker and later walling. Mr. Butterworth further records foundations at 'B', both I think post-Conquest, but which may be mentioned in connexion with the series of chambers, not an aisle, discovered at Reculver.

than those adjoining. A point which might be considered in favour of such a theory is the absence of windows in the south side of the quire at the clere-story level, where the walling with its full quota of herring-bone seems unaltered. On the other hand, it is just possible that the roof of the side chapels reached this height, but of this there is now no evidence.[1]

On either side of the quire were chapels of two stories, the communication with the quire at the ground-level being by door-openings only (figs. 2 and 10).

The north chapel measured 13 ft. by 11 ft. Its west wall has been destroyed. The door opening into the quire, 3 ft. 2 in. wide, is formed with jamb stones the thickness of the walls and arched in triangular form in two stones resting on a chamfered impost (fig. 10). In the east wall is a square-headed door-opening 2 ft. 2 in. in width, with jamb stones the thickness of the wall, and on either side of it small square aumbries (fig. 11).

The chapel on the south side, which measures 12 ft. 6 in. by 11 ft. 3 in. on plan, is also without its western wall at the ground-level (figs. 2 and 10), the space being now spanned by a square-edged Norman arch. The door opening into the quire has been altered, and probably its position also. It is square-headed with quoined jambs of green stone similar to the thirteenth-century arcade masonry. The chapel was also entered by an external semicircular-headed door (fig. 13) with a square label springing from animals' heads. The inclined jambs are double rebated and splayed. Above the arch is still another of the extraordinary beasts' heads which were remarked on the tower doorways. In the east wall of the chapel is a semicircular arch of half-round section on the soffit continued down the jambs; it is an insertion.

There was an upper floor above both chapels (fig. 14), with large openings towards the quire at 10 ft. to 12 ft. above the ground floor level. The openings have semicircular arches 5 ft. wide, and measure 8 ft. to 10 ft. from the sill to the crown of the arch. The voussoirs are square edged with ashlar soffits and spring from moulded imposts, and on one side only a square label (fig. 10).

To the north chapel this opening and the external straight joint indicating its north-west extremity are the only surviving evidences of the upper floor.

All four walls of the upper floor over the south chapel exist (fig. 14). In the north wall is the large opening to the quire; in the west a built up square-headed door and a small window (fig. 10); and in the south a two-light fourteenth-century window.[2]

It will be noted that although the chapels give a cross-form to the plan, they are not to be considered as transepts, which matured later when the wall

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[1] The quire must have been dependent for its light on the presbytery windows, aided by that transmitted through the large openings over the side chapels.

[2] Depicted within a gable in S. Lysons, *Collection of Gloucestershire Antiquities*, published 1803.

separating them from the quire was entirely removed and the opening spanned by an arch.

Until the recent excavations only the square bay on the south side of the apsidal presbytery was visible, but now the operations have revealed the foundations indicated on the plan (fig. 2) on which the polygonal superstructure was erected. These foundations are 3 ft. 9 in. wide of two parallel walls continued
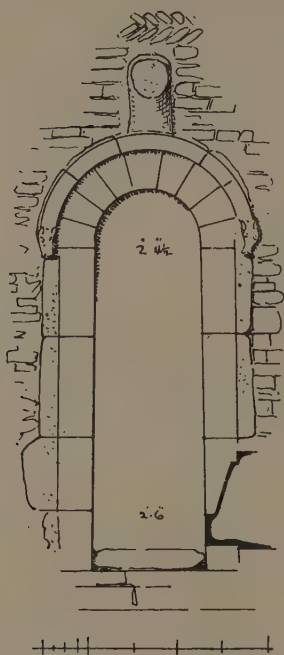

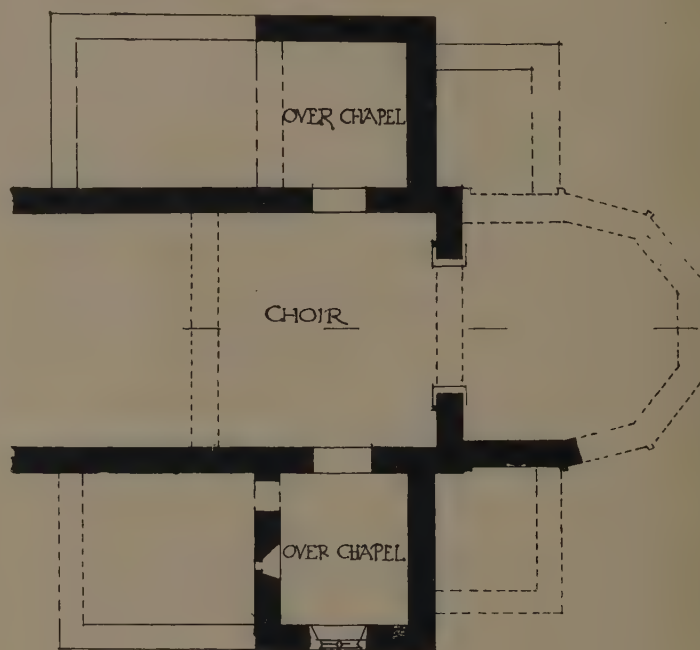Fig. 13. South door of south chapel.

Fig. 14. Plan of upper floors over chapels.

as a semicircle and of uniform depth with those of the quire gable, the whole being carried through a loose sandy earth to the level of a marl stratum about 7 ft. below the floor-level (fig. 10).

There were no other foundations or evidence of walling within the area of the apse, which was thoroughly trenched, and evidence of a crypt or prepared burial place was non-existent. The depth of the walling was occasioned by the fall of the ground from west to east, and by the need of securing a reliable foundation on which to build.

The apse was of polygonal form of two straight and five canted sides (fig. 2). The walling of the south bay (straight sided) is 2 ft. 6 in. in thickness and 7 ft. 6 in. in width between the vertical ashlar pilasters. The fragment, about 18 in. in length, of a contiguous canted bay is also straight on both faces, and encloses with the straight bay an angle of 166°. The pilaster in the angle of the south bay and the quire wall is square and 6 in. on the face, that between

the straight and canted bay is 8 in. wide and angular on the face to the contour of the plan.

The vertical ashlar pilaster near to the quire gable is carried to the eaves level (fig. 10). At 16 ft. above the base (of two square projecting members) there is a horizontal string-course forming the base of a triangular-headed arcade, and within the triangle of the existing straight bay is a sculptured panel (fig. 15) representing a nimbed angel with outstretched wings.

Fig. 15. Angel panel, south side of apse.

Whether the carved panel was repeated in each bay we cannot say. In the apse at Brixworth church the alternate bays contained windows, while at Wing church there is an arcade of semicircular arches, and above them surface pediments in which are windows in alternate bays. A like treatment may be inferred for Deerhurst, although it must be observed that there is height enough for a series of windows between the apex of the arcade and the eaves level.

The vertical pilasters, strings, and raking members are all double rebated to receive the plaster which covered the walls, some of which, over an inch in thickness, still survives.

Inasmuch as the apse above the ground is polygonal, the circular foundations might conceivably have belonged to an earlier circular apse, but careful

measurements and plotting to a large scale clearly show that the sides of the polygon were equilateral and carefully set out, and must, as they appear, be of one build with the foundations, as is demonstrated below. Deerhurst thus shares with Wing the distinction of being designed polygonally externally and internally. Brixworth is round internally and polygonal externally. They are possibly the only exceptions to the curved form which the apses of the Saxon period assumed.

Broken fragments of the apse walls are visible on the existing quire gable, showing that the apsidal presbytery was little if any lower than the quire, and, unless its roof only had been destroyed, the presbytery must have been demolished previous to the insertion of the fifteenth-century window above the quire arch.[1]

Here it must be remarked that if there is a difference in the masonry and accompanying ashlar dressings, that about the apse and the second stage of the tower must be accounted superior to the general construction.

We will now proceed to examine the evidence for the form of the apse with greater precision, which the excavations have rendered possible by allowing a comparison to be made of the disclosed semicircular foundation with the remaining south wall of the superstructure.

Between the foundations the internal width is 18 ft. 3 in., and the internal length 18 ft. 6 in. (fig. 16). The parallel foundations of which the apse is a continuation thus have a length of 9 ft. 4 in. to the springing of the curved portion.

The internal face of the straight south side of the apse, now standing, has a length of 8 ft. 1 in. to the internal angle from which the first canted side starts, of which side only a length of 1 ft. 3 in. now remains. The internal angle therefore is 1 ft. 3 in. to the west side of the springing-line of the curve of the semicircular foundation. This disposes of the suggestion that the angle may have been made out to a curve by the internal plastering,[2] for in that case the internal angle should have been to the east of the springing of the semicircle, and not to the west of it, as it actually is. Furthermore, the angle is too sharp to have been made out to a curve in the plastering.

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[1] During the fifteenth century the nave was re-roofed and the clerestory and other windows added. Parallel to and at 16 ft. from the east gable there were slight foundations, and on either side of the square bay of the apse the marks of a lean-to roof over a two-storied building, the groove for the junction of the roof on the south side being cut across the angel panel. In the masonry, at 5 ft. above the floor-level, is a narrow loop with a wooden lintel, and thinly plastered splayed jambs to the apse, possibly of the date (early seventeenth century) of the quire seating of Puritan arrangement (fig. 1). Mr. M. H. Bloxham, *Gothic Ecclesiastical Architecture*, iii, 174, writing in 1882, says : ' Many years ago I noted that the slab, or table properly so called, is loose, it is not placed north and south, but stands with the ends facing east and west, in the middle of the Chancel.'

[2] G. Baldwin Brown, *The Arts in Early England*, ii, 218–19 note, 1925 ed.

It is true that the angle is too obtuse for the side of an octagon, but the plan of the apse was not based on an octagon. The survey (fig. 16) clearly demonstrates that, if the plan of the existing side be repeated around the semi-
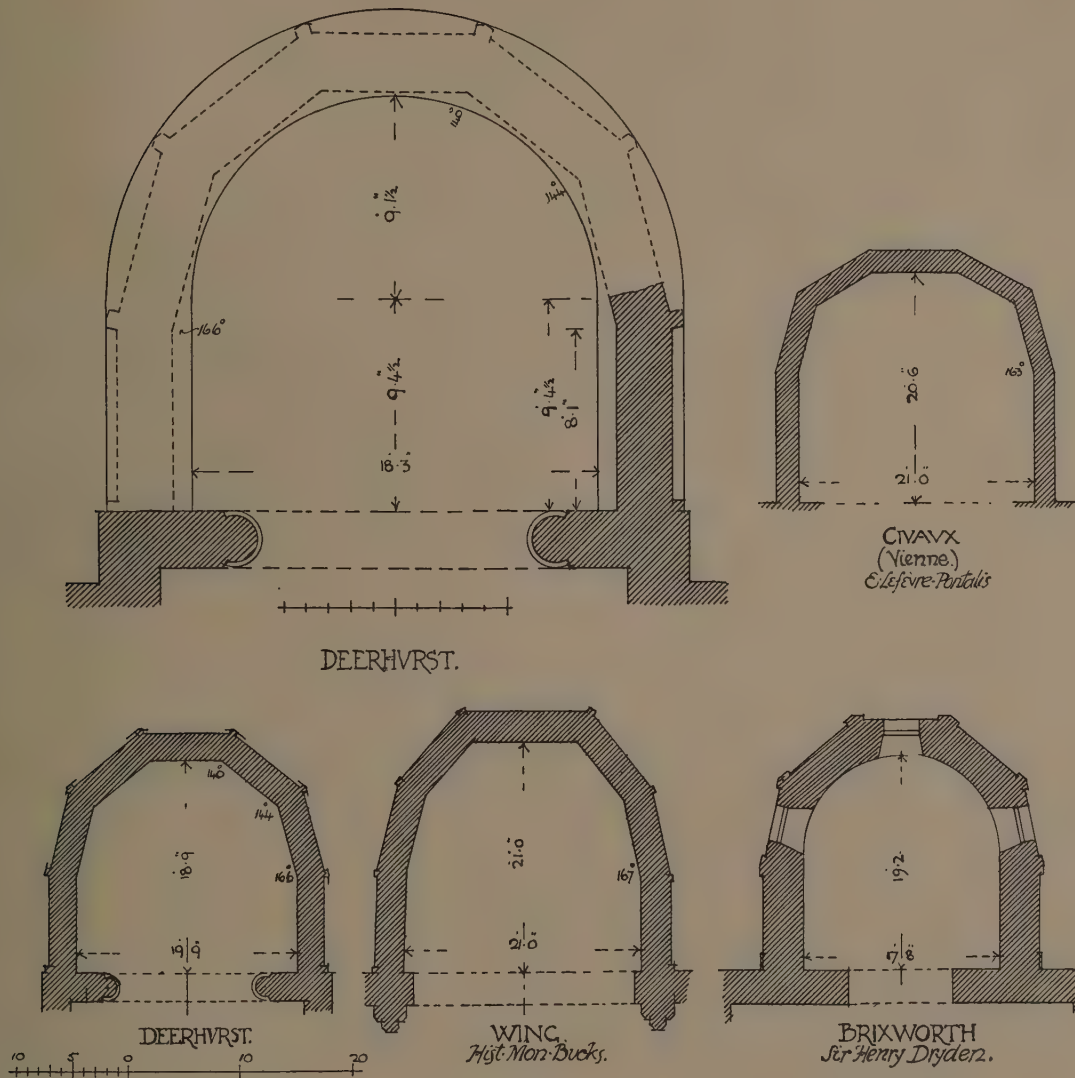

Fig. 16.   Detail of plan of apse and plans of other apses for comparison.

circle of the foundation, the result is a polygonal form of seven exactly equal sides (including the two parallel sides), and that the western internal angle of the figure exactly coincides with the internal angle still remaining at the east end of the existing straight south side.

This result of seven equal sides cannot be a mere coincidence, for if the parallel sides of the foundations had been either materially more or less than the actual 9 ft. 4 in., it would not have been possible to build an apse upon it of polygonal form with two parallel sides and five canted sides, all equal in width to the existing south side. The inevitable conclusion must be that the semi-circular-ended foundation was built to receive a polygonal apse of seven equal sides, and that the foundation and the existing south side of the superstructure form parts of the same build.

The form of this polygonal apse, elongated from east to west, deserves attention. It consists of seven sides of a dodecagon, equilateral, but not equi-angular. The western angles are about 166° (as compared with the 150° of a regular dodecagon), and the other angles are about 144° (middle) and 140° (eastern). It is worthy of note that the apse of Brixworth [1] (fig. 16, a polygonal of seven sides externally and semicircular internally), and that of Wing [2] (fig. 16, a polygonal of seven sides both externally and internally), are set out in the same fashion, with the more obtuse western angles—which according to the published plans are nearly the same as those at Deerhurst. The Carolingian apse of Civaux (fig. 16, a polygon of seven sides externally and internally) has western angles of much the same obtuseness as Deerhurst. [3] Clearly the three English apses, whatever their respective dates may be, belong to the same tradition.

As to the relation of the apse to the rest of the church, all the indications seem to favour the view that it was part of the original build. The walls of the apse have the same thickness as those of the quire and nave. In the remaining south side of the apse there is a course of herring-bone walling both on the external and internal faces at about the same level, which fact alone seems to indicate that the apse was built at the same time as the rest of the church in which herring-bone courses occur. At Brixworth the use of tufa and herring-bone courses in the middle part of the tower and in the apse has been noted by Professor Hamilton Thompson [4] as proving that these two works there are contemporary. Furthermore, at Deerhurst, in the existing walls of the upper part of the tower, and in the later additions on the west side of the chapels, no herring-bone work is to be seen, although in the south addition there is a piscina of obviously Saxon design.

[1] Sir Henry Dryden's plan of Brixworth in *Assoc. Arch. Soc. Reports* for 1890, p. 350.

[2] *R.C.H.M. Buckinghamshire (North)*, p. 332.

[3] E. Lefèvre-Pontalis, L'église romane de Civaux (Vienne) et son abside Carolingienne ', in the *Bulletin Monumental*, lxxvii (1913), 379. A Carolingian polygonal apse was rare, but the elongated semicircular apse was common, as may be seen on the plans of Saint-Riquier, Saint-Martin Angers, and Saint-Philibert de Grandlieu referred to below.

[4] *Archaeol. Journal*, xlix, 507–10.

The similarity of the treatment of the angles of the apses of Brixworth and Deerhurst is another point worthy of attention. At Brixworth the angle pilasters or 'buttresses' are 1 ft. 8 in. wide and about 6 in. in projection.[1] That remaining at Deerhurst is about 8 in. wide and 5 in. in projection, and there is a similar pilaster measuring about 6 in. each way in the western angle. These pilasters are quite different in character from the more usual strip-work used as a decoration of wall faces, and projecting only sufficiently to receive the plastering of the panels between the strips.

It has been suggested that this rib-work[2] and the triangular-headed arcading at Deerhurst show a different masonry tradition from the rest of the church. If, however, the middle part of the tower and the apse at Brixworth were built at the same time, we have in that case also the same contemporary difference of technique so far as the angle pilasters are concerned. Again the triangular strips which enclose the angel panel at Deerhurst have the same square rebated section as the hood-moulds in other parts of the church, including the double triangular-headed openings in the west gable of the nave. Rivoira noted that the apse showed a different style of masonry from that of the rest of the original structure, but he considered that they were none the less contemporary.[3] There seems to be no reason why his conclusion should not be accepted.

The apse is not the only member of the fabric which suggested to me an alteration or addition of different date when first studying the church, and which a closer examination failed to confirm.

If there is an apparent difference in character in the apse and the second stage of the tower from other work, yet it will be found that the string-course enclosing the nave, the capital of the double aperture in the nave gable and of the base of the tall sculptured panel in the porch mid-wall are identical.

If it be suggested that the quire side-chapels are later, here again the arches and their imposts towards the quire are similar to those in the west wall of the nave. Further, the details of the south door of the south chapel, those in the west front of the tower, and the wide arch of the apse are alike, while the moulded strings high up in the nave and quire walls are of the same section as the impost of the nave doorway.

It may be objected that details alone, because of their unexpected repetition, are of doubtful value when attempting a chronological dissection of a Saxon building. But at Deerhurst the summary of the common distribution of similar

[1] At Brixworth, as at Deerhurst, the angle pilasters are ridged or angular, following the plan of the contiguous bays (fig. 16).

[2] Mr. C. R. Peers in *Antiq. Journ.*, vi (1926), 211.

[3] *Lombardic Architecture* (Eng. ed.), ii, 172.

details does seem to confirm the view that its developed cross-plan is the work of one building period.

The church of cross-plan, which I have so far described, comprised the original structure. To it on two occasions additions have been made (fig. 2). The first extension included the chambers which flanked the apse and opened out of the side chapels. Of these the foundations only were disclosed; they are built over projecting footings which are not provided for the contiguous walls. Further, the southern chamber encloses the previously completed west bay of the apse with its base course and pilasters, indicating that the chamber was not contemplated in the first build. The extensions are square ended and measure about 10 ft. 6 in. north to south by 8 ft. east to west on plan. Communication with the north chapel was provided by breaking a square-headed door through the middle of the east wall, previously no doubt the site of an altar.[1] The opening to the south chapel with a semicircular arch much marked by fire is of post-Conquest date, and possibly an enlarged opening. Its introduction suggests added importance and accommodation for an altar, unless it afforded access to the twelfth-century claustral buildings, of which period there is a capital in the adjoining cellar (fig. 17).

The second addition was that of two more chapels (fig. 2), one on either side of the nave and to the west of the quire chapels. On plan they measure about 15 ft. east to west by 13 ft. north to south. The extent of the work is shown on the exterior by the character of the masonry and the vertical straight joint (without quoins or herring-bone), and on the interior by the slight bend in, and the lesser thickness of, the walls. In the south wall of the south chapel is a recessed piscina with inclined jambs. Small square-headed doors, with rebated jamb-stones the thickness of the wall, afford access from the quire to the extensions (fig. 2).

The door and window at the upper floor-level of the south quire chapel (figs. 10 and 14) were blocked by the erection of this additional chapel, unless it also was of two stories, in which case the door remained for communication between the upper chambers.

[1] Mr. Butterworth writing in 1887, says: 'Beneath the surface it occupied [the north adjunct], a large number of human bones were discovered, when, fifty years ago, the place was disturbed in the interests of farm buildings.' During the present excavations, human and bovine bones were found within the apse near the north wall: specimens were forwarded by Dr. R. W. Murray of Churchdown to Sir Arthur Keith, F.R.S., who kindly reported: 'The part of a skull is that of the long-headed Saxon type, and the thigh bone that of a man about 5 ft. 8 in. in height. The human bones are probably of medieval date, but whether pre-Norman or post-Norman no definite opinion can be expressed owing to the scarcity of material.' Outside the apse to the east of the northern adjunct, at about 2 ft. from the surface, a skull and several limb bones were found on which Sir Arthur remarks: 'It belonged to a young man with a very narrow long head and very narrow long face. The wisdom tooth had not been cut. The shape of the face has a very modern appearance.'

The sculptured features must now be considered. In their design and execution they exhibit both Celtic and Scandinavian influence.

Of the zoomorphic subjects of Scandinavian inspiration we have the beasts' heads at the springing of the labels of the tower mid-wall opening and the presbytery arch, and the larger ones over the external doors.
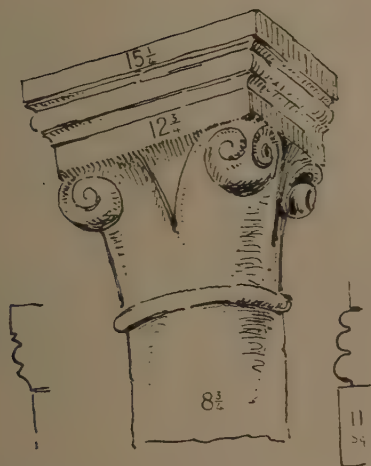
Fig. 17. Norman capital in farm cellar.　　　　　　Fig. 18. The font.

The first [1] (fig. 6) is the best preserved. It is more refined than the others in the treatment of the characteristic concentric lines about the face and the long incurved ears. The second (fig. 12) is much defaced, but was always poorer and coarser in conception than the smaller terminals. The third, over the outer doors (fig. 5), is unusually bold and prominent, both in treatment and position.

The small beasts' heads (fig. 6) might be ascribed to a period after the tenth century but for the incurved ears, which are clearly paralleled on the clamps of the Ormside bowl which Mr. E. Thurlow Leeds considers to be additions, and attributes to the end of the ninth or the early tenth century.

The nimbed figure (fig. 7) occurs over the mid-wall opening of the tower, and is enclosed in a panel 3 ft. 7 in. in height by 1 ft. 4 in. in width. The figure has been chiselled down almost level with the border of the panel, leaving only the outline as depicted. It has been suggested that the subject

[1] Inserted in the mid-wall of the tower at the restoration of 1861. The arch of the east (nave gable) opening springs from an impost, the west (external) opening was altered to receive the fifteenth-century door.

represented is that of the Virgin and Child. The panel is semicircular headed over imposts of two members slightly bevelled on the soffit, the whole being supported by a panelled pedestal divided by short shafts having stepped bases and capitals.

In the arcade of the south bay of the apse is a panel (fig. 15) 1 ft. 11 in. by 2 ft. 7 in. on which is carved in low relief a nimbed angel with outstretched wings. The face is somewhat long and narrow. The hair is curled, and by the side of the cheeks are rolls tufted at the forehead and resting on the shoulders. It is an important contribution to Saxon figure sculpture.

The bowl of the font (fig. 18), 2 ft. 6 in. in diameter and 1 ft. 8 in. in height, now rests on an extraneous shaft.[1] The shaft is partly octagonal on plan with carved spiral ornament similar to the font bowl. At Elmstone Hardwicke, near by, is an octagonal stone which has been chamfered and holed to receive a shaft. It also is decorated with spiral ornament of identical pattern.

The bowl is curved in section and is richly decorated with connected spirals effectively arranged in C-shaped curves, having a border above and below of vine-scroll work with trumpet-shaped sheaths. Flat horizontal rolls separate the spirals from the vine-scroll border, while vertical rolls connect with the horizontal and frame complete portions of the spiral ornament in panel form. Bishop G. F. Browne (*Bristol and Gloucester Transactions*, xi, 101) thinks 'We shall probably not be far wrong if we date the whole of the ornamental portions of the font to the ninth or tenth century'; and the late Mr. E. C. R. Armstrong (*Antiq. Journ.*, iii, 119) was of opinion that the spiral work of C-form in South Kyme church, Lincs. was of the ninth or tenth century. Some of the scroll work on the lower panels at Barnack church is of similar design.[2]

The south of England is singularly poor in ornamental stonework of the ninth and tenth centuries; it is therefore fortunate that so many artistic details are preserved at Deerhurst. Incidentally the carved animal heads from which the labels spring may be cited as among the earliest instances of the feature.

It has been shown that the original parts of the church are the apsidal presbytery, the quire with its two flanking chapels, the nave and the tower—all of which (except the upper portions of the tower) show herring-bone masonry; also that the chambers east and west of both chapels are additions, but still pre-Conquest work.

Deerhurst belongs to a group of churches which include a square quire interposed between the nave and presbytery—which quire was occasionally carried up as an axial tower and flanked by side chapels—an important

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[1] G. Baldwin Brown, *The Arts in Early England*, ii, 212, and *Archaeol. Journ.*, lxxviii, pl. iii, p. 436.

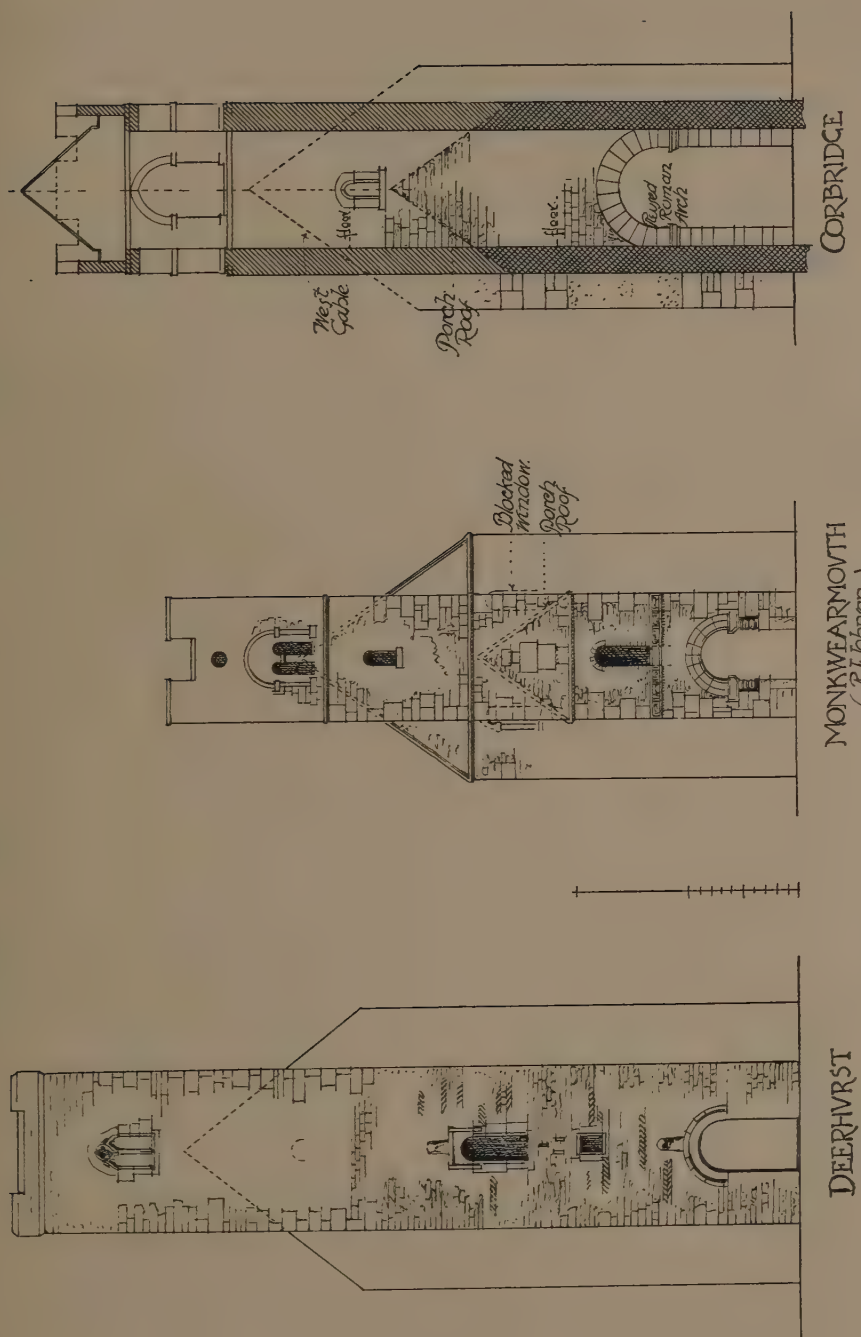[2] G. Baldwin Brown, *The Arts in Early England*, ii, 274.

Fig. 19. Towers: Deerhurst, Monkwearmouth, and Corbridge.

CORBRIDGE

West Gable

Porch Roof

Floor

Floor

Round Roman Arch

MONKWEARMOUTH
(R. Johnson.)

Blocked window.

Roof Roof

DEERHVRST

development in English church planning. It is a feature which is recorded to have existed at Winchester and at Ramsey Abbey in the late tenth century.

On the continent the cruciform plan had already been achieved during the Carolingian period, as may be seen on the plans of Saint-Riquier,[1] Saint-Martin Angers,[2] and Saint Philibert-de-Grandlieu.[3]

On the similarity of the apses of Deerhurst, Brixworth, and Wing we have already remarked. They are absolutely unlike anything that we know to have been built after the Norman Conquest, and may fairly be assigned to a date at any rate as early as the tenth century.

I venture to suggest that the evidence of the developed plan, the resemblance of the three apses, and of the sculptured details taken together, combine to restrict the choice of date to within narrow limits, near to the middle of the tenth century.

The writer is indebted to Mr. J. Bilson, D.Litt., for friendly criticism, and to the Rev. A. C. Stephens, vicar of Deerhurst, and Mrs. Vines of the Priory Farm for their sympathetic interest in the work and assistance during the excavations and examination of the church.

DISCUSSION

The DIRECTOR said the church in question had for years been a matter of dispute, and careful measurements and details had always been wanted : Mr. Knowles had gone to that trouble and provided a basis for argument. The building might be called tenth century, influenced by the Carolingian revival, with a plan almost cruciform. The difficulty had been to explain the connexion between the apse with rib-work and the side chapels, which were part of the first work. There were strong traces of burning, but none in the apse : in the south chapel the arch was flaked in an extraordinary manner, showing that it was standing during the fire ; and the apse was only a few feet distant. The apse was designed to stand clear, with no small chapels east of the transept : were the chapels earlier or later than the apse ? If later, it was curious that the archway was fired while the apse escaped : if earlier, the apse must have been built after the fire in the chapels. Material for discussing a mid-Saxon building was now available, thanks to the efforts of Mr. Knowles.

The PRESIDENT expressed the Society's appreciation of the careful and ingenious way in which the subject had been treated in the paper.

[1] Georges Durand, 'Saint-Riquier', in *La Picardie historique et monumentale*, vol. iv (1911), pp. 133 ff.

[2] R. de Lasteyrie, *L'Architecture religieuse en France à l'époque romane* (Paris, 1912), 147–9.

[3] R. de Lasteyrie, 'L'Église de Saint Philibert-de-Grandlieu' in the *Mémoires de l'Académie des Inscriptions et Belles-Lettres*, vol. xxxviii (1919).

VI.—*Post-Reformation Ecclesiastical Seals of Durham.*[1] By C. H. HUNTER BLAIR, *Esq., M.A., F.S.A.*

Read 10th March 1927

THIS Society published in vol. lxxii of *Archaeologia* an illustrated description of the almost complete series of the seals of the bishops of Durham, from William of St. Calais (1081) to Cuthbert Tunstall (1559), preserved in the treasury of the dean and chapter of Durham. This paper with the ensuing catalogue is an attempt to record the seals of later date belonging to the see and to the cathedral church of Durham, up to the abolition of what remained of the palatinate powers of the bishops in 1836. The writer thought that this would be a comparatively easy task but it has not been so, for after an exhaustive search in all likely places, the result has been disappointing ; examples have been difficult to find, some of the bishops are not represented at all and others only by their great seals in chancery. The only examples of episcopal seals of dignity which have been found later than that of Barnes (pl. xiv, no. 2) are that of Cosin (pl. xvi, no. 3) and those of Trevor, Egerton, and Barrington (pl. xvii).

It is not possible therefore to trace with certainty the steps in their development which resulted finally in the pretentious but lifeless chancery seals of Crewe and his successors, and in the decorative armorial episcopal seals of the later eighteenth-century bishops.

It was the historical continuity of traditional motive, with the gradual change of style through the centuries, which made interesting the history of the earlier seals. The alteration from the style called Gothic to that of the Renaissance in the decoration and from Black Letter to Roman capitals in the legends took place, at Durham, on the seals of Fox at the end of the fifteenth century, but the dominating idea remained the same until after Tunstall's death (1559). The long tradition is then broken, the old motives disappear, and a complete change of spirit shows itself. Our Lady with the Christ Child accompanied by the Northumbrian saints Cuthbert and Oswald, appear no more on the bishop's seal of dignity ; they no longer stand supporting him on

either side upon his great seal in chancery. The open Bible, pious mottoes, and armorial shields displace the saints, the crosier and the benediction of the earlier tradition. These later seals have no great artistic beauty; the ideas which inspired them are strange to us, but yet they have an interest of their own, for they help us to interpret the spirit of their times and the minds of the men who used them.

Pilkington (1561–76), Tunstall's immediate successor, is represented only by a fragment of the reverse of his great seal. His horse and shield bear the arms of the see; his crest is a single ostrich feather, and, for the first time since Hatfield, the mitre is absent from his helm and it never again appears on the reverse of the great seals of his successors (pl. xiv, no. 1). Barnes (1577–87) permits no episcopal insignia or any saint to appear on his two extant seals. He is shown, on his seal of dignity, seated on a throne of very inferior design, wearing cap and gown; his right hand instead of blessing grasps a birch-rod— for discipline, a scroll on his chancery seal says—his left hand in place of a crosier holds the open Bible, inscribed VERBUM DEI—for doctrine, as another scroll says. Both his seals display his strange shield of arms, and upon both is the symbolism of the birch-rod and the open Bible (pl. xiv, nos. 2 and 3). Bishops Matthew and James (1589-1617) are represented only by their great seals, on the obverse of which they are shown, clad in voluminous robes and wearing a pointed cap, without any episcopal insignia, seated on an elaborate architectural throne accompanied by armorial shields and pious mottoes. On the reverse each of them prances on horseback in full armour of plate, no shield is carried, the right hand brandishes a sword, and a great plume of ostrich feathers adorns by way of a crest their own and their horses' heads. Armorials cover the caparisons of the horses, and mottoes on scrolls entangle their feet (pl. xiv, nos. 4, 5).

Neile (1617–28) is also only represented by his great seal, but he has entirely changed the motive. In place of his own enthroned figure, on the obverse, he uses a large shield of arms of the see ensigned by a mitre with the horns at either side, the first appearance of this episcopal vestment on the seals since Tunstall. The reverse he uses to commemorate, by means of armorial shields, the sees he had occupied before that of Durham, reserving only a corner to depict himself as lord palatine (pl. xv, nos. 5 and 6). His successors, Howson and Morton (1628–59), continue the use of the armorial obverse but impale their own shields with that of the see; on the reverse, they revert to the equestrian type of the earlier style (pl. xv, nos. 3 and 4).

The Restoration brought John Cosin to Durham (1660–72), and an example of each of his seals has fortunately been preserved. The obverse of his great seal is a fine, dignified design. It breaks away from the armorial style of his

four predecessors, and shows a demi-figure of the bishop, in doctor's cap and gown, within the central arch of a classical colonnade. Above him is a finely jewelled mitre, and beneath are shields and cartouches charged with the arms of the see of Durham, of himself and of the dignities he had previously enjoyed. The reverse continues the traditional equestrian type, but it is surrounded by a legend consisting of part of two verses from the Vulgate (Eph. vi, 13 and 17) PROPTEREA · ACCIPITE · ARMATURAM · DEI · ET · GALEAM · SALVTIS · ASSUMITE · ET · GLADIVM · SPIRITVS (pl. XVI, nos. 1 and 2). This legend is that always used on the reverse of their great seals by succeeding bishops till the end of the palatinate.

Cosin's episcopal seal reproduces the design on the obverse of his great seal, altered slightly to fit the oval shape (pl. XVI, no. 3). His privy seal and signet are armorial, ensigned by a mitre but without a legend (pl. XV, nos. 1 and 2). The great seals, and probably the other types also, become stereotyped after those of lord Crewe (1674–1721) and suffer no further change except the necessary alterations of armorials and names. The equestrian reverse of Crewe's great seal alone remains (pl. XVI, no. 4), but as it is in all essentials the same as Van Mildert's (1826–36) the last of the palatine bishops (pl. XVI, nos. 5 and 6), we may reasonably assume that the obverse also remained unchanged though the earliest extant example is that of Trevor (1752). The design of the obverse is pretentious but feeble, whilst the pretty equestrian reverse is wooden and lifeless, though the armory and the lettering of the legends partly redeem the poverty of the design (pl. XVI, nos. 5 and 6). Crewe's episcopal seal has not been found, but his privy seal and signet are the same in general design and motive as the later similar seals of Trevor and Egerton (pl. XVII, nos. 4 and 5), both of which reproduce in miniature the armorial style of the larger episcopal seals (pl. XVII, nos. 1 and 2). It therefore appears probable that the episcopal seals also remained unchanged from the time of Crewe. The writer has been unable to find examples of any of the seals of Talbot, Chandler, and Butler (1721–52).

The legends throughout are in Roman capitals of a fine, clear type, and on the great seals are always in Latin ; the earlier from Pilkington to Morton (1561–1659) give both the Christian and surname of the bishop. Cosin reverts to the ancient custom and uses only his Christian name, the style adopted also by his successors. The legends on the episcopal seals, at least from Trevor, are in English, and give both the Christian and surname. On both types the date of the bishop's accession is given either in the field or at the end of the legend. In addition to the legend proper, pious or edifying mottoes appear on scrolls curling about the fields of the seals in bewildering confusion. There are no less than five of these inscribed scrolls on the reverse of Neile's great seal.

There remain some ecclesiastical seals other than episcopal which were also used within the bishopric. First in point of date of user and importance is the seal of the new foundation of the cathedral church. The monastery was surrendered by prior Hugh Whitehead on 31st December 1539, when its most ancient seal was used for the last time. On the reverse this bore the reliquary cross of St. Cuthbert surrounded by a legend of possibly tenth-century date, whilst the reverse was a beautiful ancient intaglio of the head of Jupiter the Thunderer used, with a pleasant naivety, for the head of St. Oswald, king (pl. xviii, nos. 1 and 2). The new seal is dated the following year (1540) (pl. xviii, nos. 3 and 4). It is a strange bizarre device, very different from the simplicity of its predecessor; it was apparently used until the time of the Restoration, when another was engraved of a similar style but with shields of arms of the Tudor and Stuart sovereigns added. This is the seal used by the dean and chapter at the present day (pl. xviii, nos. 5 and 6). Royal seals for use within the county palatine are represented by that made in the time of bishop Matthew (1595–1606) for sealing such writs as were thenceforth to be issued in the palatinate by the crown. The press and matrixes of this seal are still kept in the chancery office at Durham, and are represented on pl. xx, nos. 1, 2, and 3. It was superseded in the time of Barrington by the single-faced utilitarian die at present used.

Cromwell's seal, engraved by Simon, for writs within the county palatine is a beautiful and dignified design; its motive is the same as the Protector's great seal, with the arms of the see of Durham in place of those of the Commonwealth (pl. xix, nos. 1 and 2).

Sede Vacante seals are represented by that of Elizabeth used in 1576 after the death of bishop Pilkington; it is singular in that no insignia of the see appear upon it, the legend of the reverse alone telling its purpose (pl. xix, nos. 3 and 4). No example is known to the writer of the seal ordered by James I in 1617 for the vacancy following upon the death of bishop James. It appears to have been similar to the last of the series the present writer has found, that namely of Charles II, dated 1671 for the vacancy after Cosin's death. It is a clear, business-like seal, though not of any great artistic merit (pl. xix, nos. 5 and 6).

The Consistory court of Durham is represented by two seals, the earliest a plain, unadorned design, showing the arms of the church beneath an open Bible (pl. xx, no. 4). The second, dated 1750, has the same motive, but is more ornate, and displays a jewelled mitre in addition to the shield of arms and the Bible (pl. xx, no. 5).

The series ends with the strange seal of Robert Swift, vicar-general and official principal under bishops Pilkington and Barnes (pl. xx, no. 6).

3. Barnes, chancery

2. Barnes, ad causas

5. James, chancery, Rev.

1. Pilkington, chancery, Rev.

4. James, chancery, Obv.

1. Cosin, privy seal

2. Cosin, signet

3. Morton, chancery, Obv.

4. Morton, chancery, Rev.

5. Neile, chancery, Obv.

6. Neile, chancery, Rev.

CATALOGUE OF SEALS

Shield of St. Cuthbert
for the church.[1]

Shield of St. Oswald
for the see.[1]

JAMES PILKINGTON (1561–76)

Great seal, round, 85 mm., equestrian reverse, imperfect.[2]

The bishop in the plate armour of his date, with skirt of tassets, and closed circular helm, without mitre or coronet, from which floats a single ostrich plume. He brandishes a heavy sword in his right hand and on his left arm is a shield charged with the arms of the see. The heavy caparison of his horse also bears both behind and in front the same arms apparently within a border of fleurs-de-lis; the horse wears a spiked chamfron and neck armour with a large plume of ostrich feathers upon its head. Beneath the horse, upon a scroll, is an illegible motto. Legend: SIGILL . . . . PILKIN-TON . . . . (Plate XIV, no. 1).

Arms: I and IV, silver a cross patonce voided gules. II and III, paly of six silver and gules on a bend sable three molets pierced gold, a crescent for difference. Crest: a man clothed and wearing a cap, per pale silver and sable, holding a scythe in his right hand, the handle silver, the blade proper.[3]

RICHARD BARNES (1577–87)

Seal *ad causas*, pointed oval, 66 × 48 mm.[4] The bishop, in long gown and pointed cap, seated on a canopied throne, holding a birch-rod in his right hand and in his left an open Bible inscribed VERBVM DOMINI, the field is diapered with roses and slipt trefoils. Beneath is his shield of arms.

Legend: SIGILLVM · RICARDI · BARNES · EPISCO · DVNELMEN · AD · CAVSAS · ECCLICAS. (Plate XIV, no. 2).

Seal of the office of spiritual chancellor, rounded oval, 65 × 58 mm.[5] A radiated rose bearing a shield of arms charged with the arms of the church of Durham (the shield of St. Cuthbert) impaling Barnes. Above the rose two arms and hands issue from clouds, the dexter holding an open Bible inscribed PATERNO and a scroll on which is DOCTRINA, the sinister holding a birch-rod and another scroll on which is DISCIPLINA; between the two hands is the date 1577. On the sides of the rose in the field are the letters R. B., beneath it on a scroll is CRVX · VERITATE · COMES.

[1] Elazoned both for church and see with the field azure, the cross gold and the lions silver.
[2] Cast, *B.M. Seal Catalogue*, no. 2496.
[3] Grant by William Flower, Norroy, at Auckland 3 July, 1575 (MS. Ashmole, 834, fo. 12; see also *Durham Visitation*, ed. Foster, p. 254). On 15 Feb. 1560 Sir Gilbert Dethick granted him the following: silver a cross patonce voided gules on a chief vert three suns in splendour gold (B.M. Add. MS., 14295, fo. 24). I know no example of the use of this shield. The arms in the text were on his brass in Durham Cathedral (Dods. MS. 45, fo. 81).
[4] Cast, *B.M. Seal Catalogue*, no. 2484.
[5] Cast, *B.M. Seal Catalogue*, no. 2502.

Legend: SIGILLVM · OFFICII · CANCELL · ECCLII · REVERENDI · PA-
TRIS · RICI · DVNELM · EPI.   (Plate XIV, no. 3).

Arms: Azure on a bend silver between two stars gold a bear passant sable
strewn with stars gold seizing a naked man, on a chief silver three roses gules radiated
gold.[1]   Later grant—I and IV, quarterly gold and vert on a fess sable three stars gold.
II and III, azure on a bend silver between two stars gold a bear passant sable, on
a chief silver three roses gules radiated gold.[2]

MATTHEW HUTTON (1589–95)

No seals now extant.[3]

Arms: gules on a fess between three cushions silver with gold tassels, three fleurs-
de-lis gules.   Crest: a cushion as on the shield; upon it rests an open Bible inscribed
ODOR VITAE.[4]

TOBIAS MATTHEW (1595–1606)

Great seal; an imperfect example exhibited to the Society in 1886[5] is the only known
example.

Obv. The bishop, wearing rochet, cape, and pointed cap, is seated upon a throne,
beneath an arch behind which appear the pillars and traceried windows of a Gothic
church. He holds a closed book to his breast with both hands. On the dexter is a shield
of arms of the see of Durham (the sinister side containing the bishop's shield is
destroyed). On a scroll beneath is [VITA] CH'RUS MORS LVCRVM. The legend except . . .
THE . . . is destroyed.

Rev. Equestrian, the bishop in armour holding a sword gallops to the dexter over
a field of grass and flowers. Horse and rider wear large plumes of ostrich feathers.
The bishop carries no shield of arms, but the horse caparison bears on the forepart the
arms of the see, and on the hind-quarter the quarterly shield of the bishop; beneath the
horse on a scroll is [PRO VERI]TATE · ET · IVSTITIA.

The legend is almost destroyed . . . . THEW · EP . . COP . . . .

Arms: I and IV, sable, a lion rampant silver. II and III, gules, three chevrons
silver, a crescent for difference.[6]

WILLIAM JAMES (1606–17)

Great seal, round, 70 mm.[7] This seal is the same both on obverse and reverse as
that of his predecessor bishop Matthew, except that the shields bear the arms of James.

[1] Confirmed by Sir Gilbert Dethick, Robert Cooke, and William Flower, 23 April 1571.

[2] By William Flower, Norroy, 4 April 1580 (B.M. Ashmole MS., 834, fo. 35). Quarters I and IV of this
shield are the ancient arms of Barnes of Lancashire. This last shield, but quarterly of three as illustrated, was
on his brass at Durham (*Durham Monuments*, vol. v, Newcastle Records Series, p. 111).

[3] The writer thinks he has seen an illustration of Hutton's great seal, but has lost the reference.

[4] Grant by William Flower, Norroy, 1 May 1584 (B.M. MS. Ashmole, 858, fos. 237–8).

[5] *Proceedings*, xi, p. 80, and illustration opposite.

[6] These shields were both used by the family of Williams of the Principality of Wales, who claimed to be
descended from the family of Avene (*British Armorials*, pp. 93, 549). The bishop's family was originally named
Williams and came from Flint, N. Wales. John Williams, recorder of Flint, 10 Edw. IV, married the daughter
of Edward Matthews. Their son Sir George Matthews assumed his mother's name and arms (Hutchinson's
Durham, i, 472).

[7] Greenwell Deeds, no. 351, 16 Jan. 1609–10 (Newcastle Public Library).

1. Cosin, chancery, Obv.

2. Cosin, chancery, Rev.

3. Cosin, episcopal

4. Crewe, chancery, Rev.

5. Van Mildert, chancery, Obv.

6. Van Mildert, chancery, Rev.
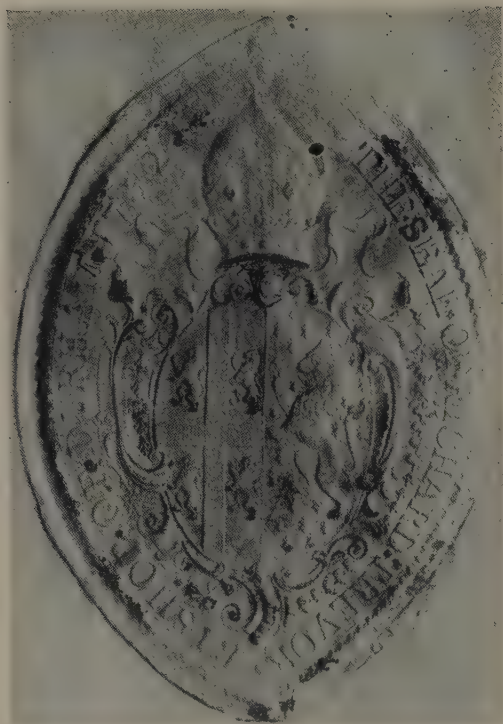
1. Trevor, episcopal

2. Egerton, episcopal

4. Trevor, privy seal

5. Egerton, privy seal
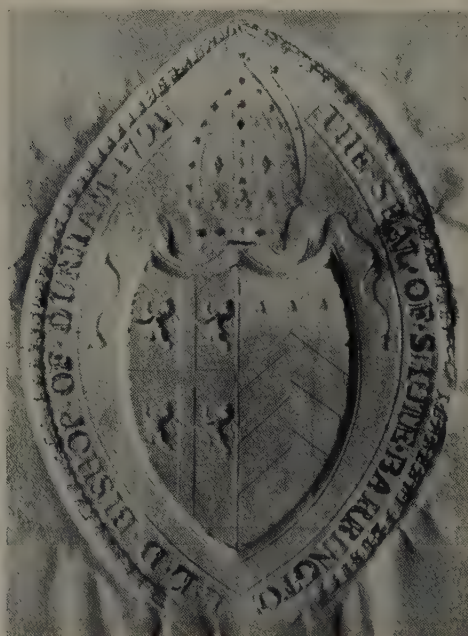
3. Barrington, episcopal

On the obverse, beneath the motto, is a shield of arms of the see of Durham impaling the arms of the bishop. The mottoes on both seals are the same, and there is the same legend on both obverse and reverse :

SIGILLVM · GVLIELMI · IAMES · EPISCOPI · DVNELMENSIS · 1606.

(Plate xiv, nos. 4 and 5).

Arms : quarterly. I and IV, sable, a dolphin silver. II and III, ermine, on a chief gules, three crosses crosslet gold. Crest, on a wreath vert a demi-bull gold.[1]

RICHARD NEILE (1617–28)

Great seal, round, 95 mm.[2]

Obv. A large shield of arms of the see of Durham, ensigned by a mitre, placed sideways, with its ribbons. Beneath the shield on a scroll NON · SINE · CRVCE.

Legend : ✠ SIGILLVM · RICARDI · NEILE · EPISCOPI · DVN . . . . . . 1617.

Rev. In dexter chief the bishop as lord palatine in armour wearing a coronetted mitre with a sweeping plume of ostrich feathers. The horse caparison bears the arms of the see. In front of the horse on a scroll is [PRO] REGI · ET · PATRIA, beneath on a like scroll is . . . . . CONFIR . . . In dexter base is a shield of arms of the see of Lichfield[3] (party gules and silver, a cross potent between four crosses, all counter-coloured) impaling Neile ; on a scroll partly surrounding the shield is FIDEI | SVMA | VNIONIS | CENTRVM. In sinister chief is a shield of the arms of the see of Lincoln (gules two leopards gold on a chief azure our Lady crowned and vested seated, holding in her right arm the Christ child and in her left hand a sceptre all gold) impaling Neile as before ; on a scroll to the dexter is ET · IN · CVNIS · LEO. In sinister base a shield of the see of Rochester (silver, on a saltire gules an escallop gold) impaling Neile as before on a scroll to the dexter HINC NOSTRA SALVS. Beyond the shield on the sinister is the flowering branch of a rose tree.[4] A laureated border takes the place of the legend. Plate xv, nos. 5 and 6).

Arms : paly silver and gules on a fess gules, a crescent silver.[5]

GEORGE MONTEIGNE (1628)

No seal of this bishop is known.

Arms : lozengy gold and azure on a chief gules, three crosses crosslet gold.[6]

JOHN HOWSON (1628–32)

Great seal, round.[7]

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[1] Recorded at the Visitation of Durham in 1615 by Richard St. George, Norroy (ed. Forster, p. 186).

[2] Attached to charter dated 30 Sept. 1620 (*Proceedings Soc. Ant. Newc.*, 2nd ser., x, 306).

[3] He was bishop of Rochester 1608–10, of Lichfield 1610–14, of Lincoln 1614–17, of Durham 1617–28, of Winchester 1628–32, archbishop of York 1632–40.

[4] See Hutchinson's *Durham*, i, 489.

[5] An adaptation of the ancient arms of Fitz Nele (Parl. Roll of Edw. II). In November 1612 William Camden, Clarencieux, granted him by patent the arms : ermine a lion rampant between three dexter hands couped gules. Crest : a dragon's head gold wounded in the neck gules (B.M. Harl. 6095, fo. 24). A shield apparently never used by the bishop.

[6] Pedigree, Surtees, *Durham*, i, xci. Bedford's *Blazon of Episcopacy* names a grant of 1613 ; this the writer has not been able to find.

[7] Described from engraving in Hutchinson's *Durham*, i, 494.

Obv. A shield of arms of the See of Durham impaling Howson, ensigned by a mitre. On a scroll beneath the shield is CRVX MIHI SCVTVM.

Legend: SIGILLVM · IOHANNI[S · H]OWSON . EPISCOPI · DVNELMENSIS · ANNO · DNI · 1628.

The reverse is the same design as the reverse of the seals of bishops Matthew and James except that the hind caparison of the horse bears the arms of Howson.

Legend: EXVLTATIONES · DEI · IN · ORE · SVO · ET GLADIVS · · · · · · IN · MANV · Pˢ· 149.

Arms: quarterly silver and sable, four roundels counter-coloured. Crest: out of silver clouds a bull's head azure, strewn with stars gold. Motto: QVOT MARIA IN TRAVI DVCETE.[1]

THOMAS MORTON (1632–59)

Great seal, round, 90 mm.[2]

Obv. The same design as the previous seal but with the arms of Morton impaled. On a scroll beneath is . . . LEO DE · IVDA.

Legend: SIGILLVM · THOMÆ · MORTON · EPISCOPI · DVNELMENSIS · ANNO DOMINI · 1632.

Rev. Similar in general style to the previous seals, but from a new matrix; the plumes on both rider and horse are larger; a laureated border replaces the legend. On a scroll in front of the horse is . . . . . TI, on a similar scroll behind it is . . . . . The horse caparison is blazoned ermine only, possibly the opposite side bore the bishop's other quartering. (Plate xv, nos. 3 and 4).

Arms: quarterly. I and IV, gules, a goat's head rased silver with gold horns. II and III, ermine.

JOHN COSIN (1660–72)

Great seal, round, 90 mm.[3]

Obv. Beneath a central arch in a classical colonnade, a demi-figure of the bishop in doctor's cap and gown, holding a book on a ledge in front of him, above him on the soffit of the arch IN · DOCTRINA · SANA · ; on the architrave of the colonade is IN · FIDE · NON · FICI, above again is a jewelled mitre with its ribbons. Beneath the bishop is a shield of the arms of the see of Durham; on its dexter is a cartouche charged with the arms of Peterhouse Cambridge [4] (gold, three pales gules, a border gules charged with eight coronets gold); on the sinister is a like cartouche bearing the bishop's own arms (azure, a fret gold). Beneath the arms of Durham is another shield of the arms of the see of Peterborough [4] (gules two keys saltireways between four crosses crosslet fitchy gold); below this, on a scroll, is CRVX · CHRISTI · ROBVR · FIDEI.

Legend beginning on the lower dexter side: SIGILLVM · DOMINI · IOHANNIS · DVNELMENSIS · EPISCOPI · ANNO · DOMINI · 1660. (Plate xvi, no. 1).

Rev. Equestrian as before, but the figures both of rider and horse are more virile and lifelike.

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[1] Confirmed by William Camden, Clarencieux, Feb. 1605 (B.M. Harl. 6095, fo. 20).

[2] Cast, Society of Antiquaries of London. Also broken fragment attached to charter of 20 Dec. 1632 (Greenwell Deeds, Public Library, Newcastle, no. 393).

[3] Cast, from the original matrix at Auckland.

[4] He was master of Peterhouse 1634–40, installed dean of Peterborough 7 Nov. 1640.

Legend: PROPTEREA · ACCIPITE · ARMATVRAM · DEI · ET · GALEAM · SALVTIS · ASSVMITE · ET · GLADIVM · SPIRITVS.[1] (Plate xvi, no. 2).

Episcopal seal, oval, 82 × 63 mm.[2]

The same design, legend, shields, and mottoes as on the obverse of his great seal, slightly altered to fit the different shape. (Plate xvi, no. 3).

Privy seal, oval, 30 × 26 mm. Signet, oval, 18 × 15 mm.

Both are armorial, the see impaling Cosin, ensigned by a mitre, within a laureated border with no legend or motto.[3] (Plate xv, nos. 1 and 2).

Arms: azure, a fret gold.

NATHANIEL, LORD CREWE (1674–1721)

Great seal, round, 95 mm.[4]

Rev. Equestrian, the same in general style as that of his predecessors, but from a new matrix. The bishop is in plate armour and wears an open helmet surrounded by an earl's coronet [5] from which flows a plume of ostrich feathers, his horse wears a saddle cloth but no caparison, and beneath it is seen a view of the city of Durham. Above the horse is a cartouche of arms, the see of Durham impaling Crewe; it is ensigned by a jewelled mitre surrounded by a coronet of strawberry leaves. The legend is the same as on Cosin's reverse. (Plate xvi, no. 4).

Obv. Unknown.

Privy seal, oval, 45 × 33 mm. On a cartouche, the arms of the see of Durham impaling Crewe, above is a jewelled mitre. No legend.

Arms: azure, a lion rampant silver.

WILLIAM TALBOT (1721–30)

No seals known.

Arms: gules, a lion rampant and a border engrailed gold.

EDWARD CHANDLER (1730–50)

No seals known.

Arms: checky gules and silver, on a bend sable three lions passant silver.

JOSEPH BUTLER (1752–71)

No seals known.

Arms: Silver between two bastons engrailed sable, three covered cups bendways sable.

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[1] Ephes., vi, 13 and 17. [2] Cast, Society of Antiquaries of London.

[3] Casts, Society of Antiquaries of London.

[4] Cast, *B.M. Seal Catalogue*, no. 2499.

[5] Upon the use of a coronet by the bishops of Durham see *Herald and Genealogist,* viii, pp. 136–8 ; also *Durham Seals.*

Richard Trevor (1752–71)

Great seal, round, 95 mm.[1]

Obv. The bishop, wearing cope and jewelled mitre, with coronet, standing beneath a triple canopy supported by four columns, holding his crozier in his right hand and the Bible in his left. On his dexter, in a panel of rectangular moulding is a cartouche of the arms of the see of Durham ensigned by a jewelled mitre with coronet; on his sinister is a like cartouche bearing the arms of the bishop. Beneath in the centre is a shield of the see impaling Trevor.

Legend: SIGILLVM · DOMINI · RICHARDI · DVNELMENSIS · EPISCOPI · ANNO · DOMINI 1752.

Rev. The same as Crewe's with alterations of arms.

Episcopal seal:[2] pointed oval, 90 × 65 mm., armorial, on a cartouche the arms of the see of Durham impaling Trevor; above is a jewelled mitre with its ribbons, and surrounded by a coronet of strawberry leaves.

Legend: THE · SEAL · OF · RICHARD · TREVOR · BISHOP · OF · DURHAM · 1752. (Plate xvii, no. 1).

Privy seal, oval, 45 × 35 mm.[3] Armorial, on a cartouche the see impaling Trevor, ensigned by a jewelled and coronetted mitre with its ribbons; no legend. (Plate xvii, no. 4).

Arms : party per bend sinister ermine and erminois, a lion rampant gold.

John Egerton (1771–87)

Great seal:[4] *Obv.* and *Rev.* the same as his predecessors, with name, arms, and date altered.

Episcopal seal:[5] pointed oval, 90 × 60 mm. On a cartouche the arms of the see of Durham impaling Egerton, ensigned by a jewelled and coronetted mitre with its ribbons.

THE SEAL OF JOHN EGERTON BISHOP OF DURHAM 1771. (Plate xvii, no. 2).

Privy seal:[6] pointed oval, 47 × 30 mm. Arms and design like that of his episcopal seal, but without the legend. (Plate xvii, no. 5).

Arms : silver, a lion rampant gules, between three pheons sable.

Thomas Thurlow (1789–91)

No seals known.

Arms: silver, on a chevron cotised sable three porticullisses silver, a crescent for difference.

Shute Barrington (1791–1826)

Great seal:[7] Obverse and reverse the same as his predecessors, with name, arms, and date altered.

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[1] This is the same as the seals of all the later palatine bishops, for illustration see plate xvi, nos. 5 and 6.
[2] Durham Cath. Lib., Longstaffe MS. 44.   [3] *Ibid.*
[4] Attached to a charter granted to the city of Durham, in the custody of Mr. G. A. Carpenter, town clerk of the city.
[5] Durham Cath. Lib., Raine's MS.   [6] *Ibid.*
[7] Impression at Auckland Castle.

1. Durham Convent, Obv.

2. Durham Convent, Rev.

3. Cathedral Chapter of Durham, Obv.

4. Cathedral Chapter of Durham, Rev.

5. Cathedral Chapter of Durham, Obv.

6. Cathedral Chapter of Durham, Rev.

1. Cromwell for Durham writs, Obv.

2. Cromwell for Durham writs, Rev.
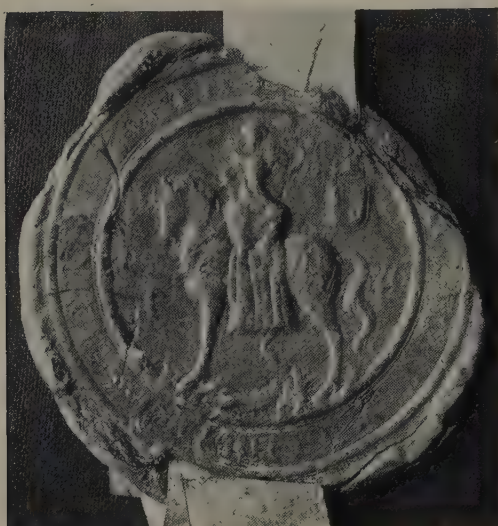
3. Elizabeth sede vacante, Obv.

4. Elizabeth sede vacante, Rev.

5. Charles II sede vacante, Obv.

6. Charles II sede vacante, Rev.

Episcopal seal:[1] pointed oval, 90 × 60 mm. On a shield of arms, the see impaling Barrington; the shield is ensigned by a mitre with coronet and ribbons. (Plate XVII, no. 3).

THE · SEAL · OF · SHUTE · BARRINGTON · L.L.D · BISHOP · OF · DUR-HAM · 1791.

Arms : Silver, three chevrons gules and a label azure.

WILLIAM VAN MILDERT (1826–36)

Great seal :[2] obverse and reverse the same as Barrington's, with name, arms, and date altered. (Plate XVI, nos. 5 and 6).

Episcopal seal : the same as Barrington's, with alteration of arms, name, and date.

Arms : gules two scythe blades saltireways, the points upwards, silver.

Sede Vacante Seals.

ELIZABETH [3]

Round, 80 mm.

Obv. Equestrian, the queen seated side-saddle, her right hand holding a sceptre, her left a slipt rose. Above the horse's flank is a shield of arms, bearing the arms of the see of Durham, ensigned by a coronetted mitre. In the field is the date 1576.[4]

✠ . . . . ANGLIE · FRANC · ET · HIB · REGINA · FIDEI · DEFENSOR · ETC.

Rev. A shaped shield of arms, France and England quarterly, ensigned by the royal crown.

✠ SIGILLVM · REGINAE · ELIZ · P.VA · EPATVS · DVNELM.

(Plate XIX, nos. 3 and 4).

CHARLES II

Round, 60 mm.

Obv. A shield of the royal arms as borne by the Stuart sovereigns; the shield is surrounded by the garter with motto, and above it is the royal crown.

CAROLVS · II · D · GRA · MAG · BRIT · FRANC · ET · HIBER · REX · FI · DEF ·

Rev. A shield of arms of the see, ensigned by a mitre with its ribbons.

+ SIGILL DOM NOSTRI REGIS CAROLI II PRO EPISCO DVNELM SE VACANTE 1671.

(Plate XIX, nos. 5 and 6).

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[1] Durham Cath. Lib., Raine's MS.
[2] Cast from the matrix B.M. 2500.
[3] Belonging to Miss Edleston of Gainford.
[4] For the vacancy following the death of bishop Pilkington on 23 Jan. 1576.
[5] Durham Treasury, Misc. Chart. 6898, dated 15 Aug. 1672.

Seals for Chancery Writs.

CHANCERY SEAL (*circ.* 1596)[1]
Round, 65 mm.

Obv. The chancellor in cap and cloak seated on a throne beneath an arch, holding a book in his hands.   Beneath his feet is a shield of arms of the see.   The field of the seal is floriated.

✴ SIGILL : COMIT · PALATINI DVNELM AD BRIA ET ALIA IN EODEM COM : SIGILLANDA DEPVTAT.

Rev. Equestrian of similar style to the reverse of the great seals of the bishops.   The legend is the same as on the obverse except that SIGILLANDA is contracted to SIGILL.   (Plate xx, nos. 1, 2, and 3).

OLIVER CROMWELL[2]
Round, 95 mm.

Obv. A shaped shield of arms of the see, with a cherub above and a seraph at each side.

AD : BREVIA : IN : EODEM : COM : SIGILLAND : DEPVTATVM · 1656.

Rev. Equestrian, Cromwell as Lord Protector, a baton in his right hand, the horse pacing to the dexter ; above the horse's flank is a cartouche of the arms of the see.   (Plate xix, nos. 1 and 2).

CHAPTER OF THE CATHEDRAL CHURCH OF DURHAM
First seal, round, 75 mm.[3]

Obv. Our Lord, radiated and with cruciform nimbus seated upon a rainbow.   He wears an outer cape fastened at the breast by a cross-shaped brooch and lined with ermine ; this is open in front showing his naked body, but falls in folds over his knees.   His hands, feet, and side show the *stigmata*. His feet rest upon an orb.   Beneath the rainbow at each side is a small figure ; that on the dexter is standing and wears a full cloak, that on the sinister is kneeling and wears only a loin cloth of hair, both are nimbed.   Surrounding the inner border is a circle of clouds.

+ SIGIL : CAPITVLI + DVNELM + CATHED + ECCLESIE + CHRISTI + ET : BTE : M · VIRGIS.   (Plate xviii, no. 3).

Rev. Our Lady, in voluminous robes standing within the horns of a crescent ; two angels uphold her at each side.   Over her head is a crown with a nimbed dove with outspread wings upon it.   The crown is upheld on the dexter by a demi-figure of God the Father issuing from clouds nimbed and wearing the tiara, on the sinister it is supported by God the Son with cruciform nimbus.   The inner border is surrounded by a circle of clouds.

+ MARIA + SEMPER + VIRGO + MATER + CHRISTI + ANNO + REGIS + HENRICI + 8 + 32. (Plate xviii, no. 4).

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[1] This was made towards the end of the sixteenth century for sealing such writs as were thenceforth to be issued in the county by the crown.   The illustrations are from the original press preserved in the Chancery office at Durham.   It was used until the time of bishop Barrington when a new die of single faced equestrian type was made ; this is not a seal but a stamp to impress documents with ink from a pad.

[2] Attached to a charter of Richard Cromwell, 3 Mar. 1658, belonging to the writer.

[3] From a cast of the matrix at Auckland.

3. Durham Chancery seal, matrix, Obv.

6. Durham: Robert Swift,
Vicar-general
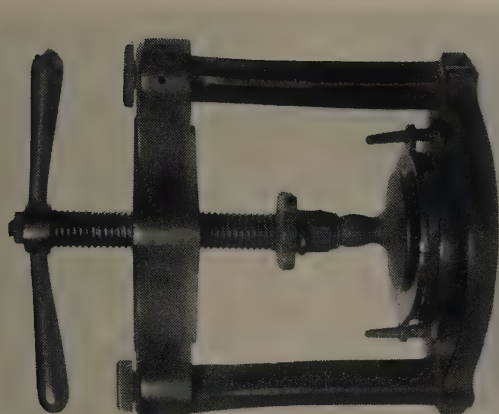
1. Durham Chancery seal, the press
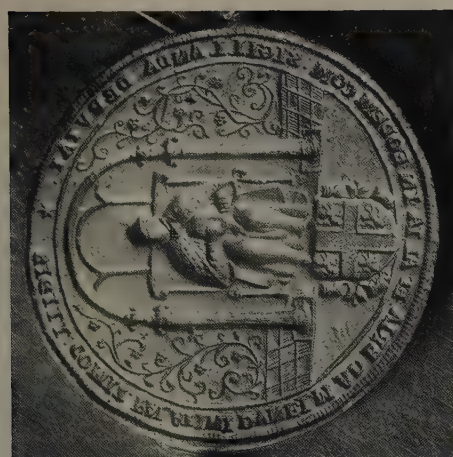
5. Durham Consistory Court

2. Durham Chancery seal, matrix, Rev.

4. Durham Consistory Court

DEAN AND CHAPTER OF DURHAM

Second seal,[1] round, 75 mm.

Obv. Our Lord robed and seated on a rainbow which springs from clouds at each side, his feet resting upon an orb. His head is radiated and his hands spread out at each side. Beneath the orb is a shield of the arms of the cathedral church.

+ SIGILL · DECANI · ET · CAP · ECCLES · CATH · CHRISTI · ET · B · MARIÆ · VIRG · DVNELM. (Plate XVIII, no. 5).

Rev. Our Lady robed and with radiated head, standing on a crescent; on the dexter side is a shield of the royal arms as borne by the sovereigns of the house of Tudor, with the date 1540 below; on the sinister is a similar shield with the royal arms as borne by the Stuart sovereigns and the date 1660 below. Above both shields is a royal crown.

✠ INSTAVRAVIT · HENRICVS · 8 · ANO : REGNI · 32 : RESTAVRAVIT · CAROLVS · 2 · ANO : REGNI : 12. (Plate XVIII, no. 6).

Seals of the Durham Consistory Court.

(1) Oval, 75 × 55 mm.[2] A shield charged with the arms of the church of Durham (a cross flory between four lions rampant); above the shield is an open Bible inscribed IVDICIVM IEHOVÆ.

+ SIGILLVM : CONSISTORII : DVNELMENSIS. (Plate XX, no. 4).

(2) Oval, 71 × 58 mm.[3] A shield of arms of the church of Durham, ensigned by a jewelled and coronetted mitre with its ribbons and the date 1750; beneath is an open Bible inscribed IVDICIVM IEHOVE. Around the lower part of the seal on a scroll:

THE SEAL OF THE CONSISTORY OF DURHAM. (Plate XX, no. 5).

ROBERT SWIFT (vicar general and official principal, *c.* 1561–77)

Pointed oval, 75 × 45 mm.[4] A demi-figure, nimbed, of our Lord in glory, above his head VENITE, holding in his right hand a crown, beneath it on a scroll PREMIV ·, his left holds a flaming sword, beside it PENA ·; above him are two cherubs blowing horns; beneath him is a crowd of people hailing him. In base is the open Bible VENI · DNE · IESV · IVD · IVS · AZZ · (?).

Legend : SIGIL · ROBER · SWYFT · · · · · IA · ET · VICAR · DVNELM. (Plate XX, no. 6).

DISCUSSION

Rev. E. E. DORLING welcomed the later seals, which, unattractive as they were, were symptomatic of the craftsman's mind and as such within the scope of the Society. The Barnes coat seemed to him inexplicable, though the connexion between 'bar' and 'bear' might be due to a kind of punning armory. The coronetted mitre was an interesting point : it was first shown by Crewe, and two or three subsequent bishops had adopted it.

The DIRECTOR pointed out that the bear was shown eating something human, and suggested that canting heraldry was capable of connecting 'bear' and 'bairn'.

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[1] From the original matrix, still used, reproduced by permission of the dean and chapter.
[2] From the bronze matrix, belonging to the writer. Upon these courts, see *Arch. Journ.*, lvi, 85 ff.
[3] From a sketch in Longstaffe's MS., no. 44 (Cath. Lib. Durham).
[4] Sketch in Longstaffe's additions to Surtees (Cath. Lib. Durham).

The PRESIDENT thought that progress had been made since Sir William Hope condemned the later seals, which might be decadent but were instructive and had some merits of their own. It was curious that in 1660 a seal was produced with a central figure like a Greek bas-relief of the fourth century. The style was not hide-bound, but showed fancy and a taste for portraiture; and there was a measure of invention and hilarity for which the bishops were to be applauded.

Mr. BLAIR replied that Mr. Dorling's suggestion was certainly ingenious. Some of the Palatine seals showed a crest coronet round the mitred helm; and a coronetted mitre was used as an official seal by two of the bishops' sheriffs in the fourteenth and fifteenth centuries, but the seals did not substantiate the fanciful suggestion that the bishops of Durham ever actually wore a coronet round their mitre.

VII.—*Pre-Roman Remains at Scarborough.* By Reginald A. Smith, *Esq.,*
Vice-President.

Read 17th March 1927

At the eastward extremity of Castle Hill, Scarborough, below medieval
and Anglo-Saxon chapels and the foundations of a Roman signal-station, have
been found several filled-up pits containing pottery fragments of a date long
anterior to the work of about A.D. 370, as the Roman walls had been carried
over some of them with no precautions against settlement, and the contents
showed no admixture of Roman date. In fact there must have been an interval
of several centuries, as the potsherds can hardly be later than La Tène I, and
belong more probably to the first part of the Early Iron Age, generally named
after Hallstatt, the typical site in Upper Austria. About half an acre has been
excavated by Mr. F. G. Simpson, now Director of Romano-British Field-studies
at Durham University, on behalf of the Scarborough Corporation, with the active
co-operation of H. M. Office of Works; and a preliminary report on the Roman
building has been written by our Fellow Mr. R. G. Collingwood for the
Corporation (see also *Archaeological Journal*, lxxix, 390).

In view of the persistent demand for stratification as a clue to date and
sequence of types, it may be stated at once that after prolonged excavation and
consideration of the site, Mr. Simpson has come to the conclusion that the pits
on Castle Hill were only in use for a few seasons, and consequently that the
whole group of relics must be contemporary. At first the various bands of clay
suggested considerable intervals, and the objects were scrutinized for evidence
of evolution or the introduction of new types; but the same deposit of clay in
pits left open during the winter was observed on resuming work in the spring,
and this rather unexpectedly solved the problem, as the pits were probably
in use as many years as there were clay-deposits in them. On this working
hypothesis (to take the lowest estimate) the pottery in and around the pits may
be treated as contemporary even if not entirely homogeneous; but the argument
does not apply to the bronzes, which were found on the level away from the
pits and possibly had nothing to do with the occupation in question.

Possibly a thousand years before the signal-station was built the promontory
was occupied by people who left no trace of habitations or burials, but dug
numerous pits (of which about thirty have been cleared out) for the disposal of
rubbish, chiefly bones of domestic animals and broken pottery for kitchen or

table use.   Cooking was evidently done with pot-boilers, stones being heated and dropped into water-vessels buried to the brim in the ground to relieve the pressure.   Food to be cooked was contained apparently in smaller pots suspended in the boiling water.   Several such cooking-places have been found as well as good evidence of bronze-casting, flint-chipping, and weaving ; and here emerges the main problem of this early site.   There are signs that the occupation lasted only a few winters, but there are implements that must be referred to the Bronze Age (if the received classification is to stand), and traces of Bronze Age technique in the large amount of pottery recovered.   Are these the remains of Bronze Age settlers, surprised or enslaved by strangers from overseas who brought pottery of new forms and varied texture, but left only one small piece of iron on the site to show that they were in advance of the native population ? That is merely a suggestion, but it seems the best solution apart from more complete excavation, and is symbolized in one large fragment of pottery (pl. xxi, no. 9) which has decoration in the style of both periods.   If the whole series dates from the dawn of the Early Iron Age, it is hardly later than the contents of Heathery Burn Cave, described by Canon Greenwell in *Archaeologia*, liv, 87 ; and the Scarborough discoveries are sufficient evidence of the arrival of strangers (whether invaders, traders, or adventurers) from some area in touch with the Hallstatt culture of central Europe.   In a word the excavation justifies a Hallstatt period for Britain (where it has till recently been little more than a theory), and gives a relative date for the end of our Bronze Age.

Whether contemporary or not with the pottery, the bronzes should first be described, as they mark the close of the Bronze Age and are clearly of native manufacture, quite distinct from contemporary models of the Continent.   They were found, not in the rubbish-pits, but on the occupation level in which these excavations were made by the new-comers responsible for the potsherds.

Two complete socketed celts, generally recognized as belonging to our Bronze Age, and not duplicated abroad, come from the site, and one is illustrated (fig. 1).   The length is 3.3 in., the mouth square, and the metal exceptionally massive.   There is a loop for attaching a thong to the haft, and on either broad face are three vertical ribs by way of ornament ; inside can be seen the ribs produced at the junction of the two halves of a clay core (shown above).   The other is the same length but has a pale green patina, and is in a crumbling condition in places.   The ribs are less pronounced, both inside and outside, and the cutting edge is more curved and rather wider.   Fragments of more than one other socketed celt were also collected, perhaps intended for recasting, as a runner or jet is illustrated (fig. 2) as evidence of a local bronze industry : it was found inside the celt first described.

The blade of a chisel (with the missing parts restored in fig. 3) is indicative of a late stage in the Bronze Age, and this spreading type is not uncommon. Its date is fairly well established, though examples have also been found on the predominantly Roman site of Traprain Law (*Proc. Soc. Ant. Scot.*, lv, 166, 168, 170, also a fragment of a socketed celt, p. 189, fig. 22, no. 10).

Fig. 2. Bronze jet of casting, with side view. (⅔)

Fig. 1. Socketed celt, with top view. (⅔)
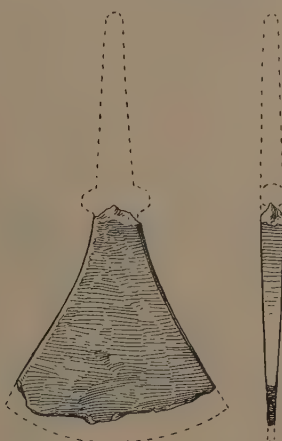
Fig. 3. Bronze chisel, with side view. (⅔)
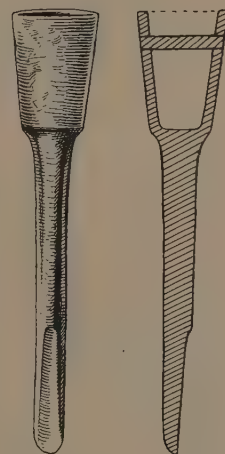
Fig. 4. Bronze socketed gouge. (⅔)

A rarer find is a gouge (fig. 4), with narrow solid stem and short socket, now in a crumbling condition ; but enough remains to show there was originally one round hole (probably two) for a bronze pin to fix the wooden handle.

A fairly close parallel to this form may be seen in the Pitt-Rivers Museum at Farnham, Wilts., among fragments from a bronze hoard found at Donhead, Wilts., mentioned (not described) in Pitt-Rivers' fourth volume, p. 16 of preface. He observed that it was a founder's hoard containing for the most part large celts, even fragments of which would contain a good deal of metal, as opposed to awls, wire ornaments, and razors. · The gouge from Donhead is about 7 in. long with socket much wider than the shaft.

With the same patina are parts of two nail-headed bronze pins (fig. 5), the middle portion of an awl, with square section tapering towards both ends ; two stout rings (fig. 6) now worn thin in places, and possibly horse-harness, another

measuring 0·9 in. across; and three pieces of two plain armlets with different sections, no doubt of the same type as the complete specimen recovered (fig. 7), which now has the ends overlapping.

The chief specimen of shale or inferior jet is a fragment (fig. 8) which seems to have been originally a pendant of crescent form, perhaps a relic of moon-

Fig. 5. Bronze pin. (⅔)
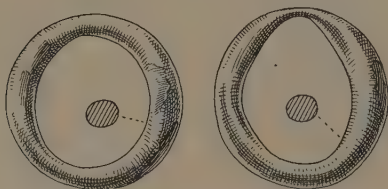
Fig. 6. Bronze harness-rings. (⅔)

Fig. 7. Bronze bracelet. (⅔)
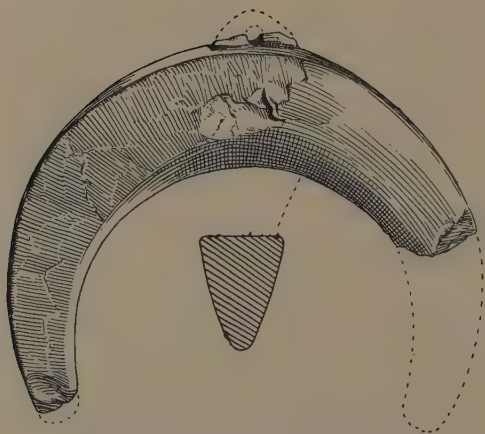
Fig. 8. Shale crescent pendant. (⅔)
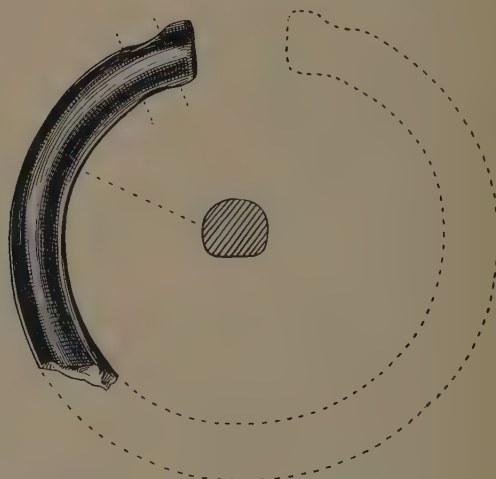
Fig. 9. Part of jet armlet. (⅔)

worship like many Roman examples in bronze and other materials. The extreme breadth is 4 in., and the restoration is conjectural but almost certain, there being part of the perforation visible above. A possible parallel is an undated fragment in the Museum of Antiquities at Edinburgh (*Proc. Soc. Ant. Scot.*, l, 232, fig. 12), which may be half a crescent subsequently grooved for suspension. An analogue in jadeite, 2½ in. across, from a sepulchral grotto in Isère, is illustrated in de Mortillet's *Musée préhistorique*, pl. lxix, no. 774.

Another fragment may be classed as jet (fig. 9), and probably belonged to an armlet just over 4 in. in outside diameter. The boring at one end is roughly

executed (hour-glass pattern), and may represent a subsequent joint of two broken portions, as the end looks more like an accidental fracture than a finished terminal.   There are seven other fragments of lathe-turned shale belonging to bracelets or smaller rings; a hemispherical stud 0·7 in. in diameter, unperforated; and a rudely cut stopper[1] for a bottle, originally somewhat deeper as indicated in fig. 10.   All are presumably of the Roman period, though the use

Fig. 10.   Shale stopper.
(⅔)
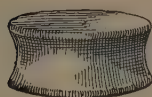
Fig. 11.   Pottery disc.   (⅔)
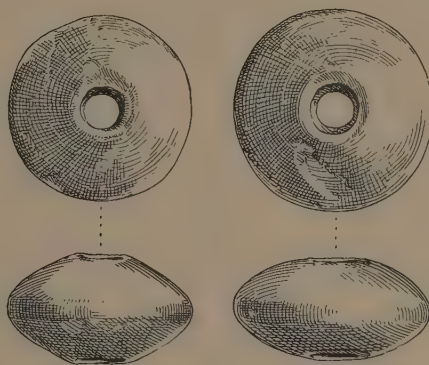
Fig. 12.   Fig. 13.
Two pottery spindle-whorls.   (⅔)

of the wheel in the manufacture of shale or jet rings began somewhat earlier (e. g. *Glastonbury Lake-village*, i, 258).

A pottery disc with incurved sides (fig. 11) resembles nose and ear ornaments of certain African tribes, but probably served a less grotesque purpose, as another was found in the third or Celtic level at Traprain Law (*Proc. Soc. Ant. Scot.*, liv, 81, fig. 14, no. 4, see p. 83), where its bobbin-like appearance was duly noted.

The spindle-whorls are referable to the Early Iron Age, and have some slight differences.   The smaller (fig. 12) tends towards the double-cone and is of fairly soft ware with micaceous spots; the other (fig. 13) is darker and considerably harder, with the faces regularly convex.

Mention must be made of a saddle-back quern for grinding corn, found in the same area as the bronze implements, and probably contemporary.   It measured 19 in. by 15 in. by 6 in., but the upper stone or roller was not recovered, and the type is not datable in itself, as it occurs in the neolithic period at Windmill Hill, near Avebury (*Antiquity*, i, 54); at Park Brow, near Cissbury

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[1] A stopper of pottery found at the foot of a monolith, Trelew, Cornwall, is in the British Museum (Borlase, *Nenia Cornubiae*, p. 102).

(*Archaeologia*, lxxvi, 4), and as late as the Glastonbury lake-village (first century, B. C.). It is regarded as the predecessor of the rotary quern which dates from the period of La Tène, as for instance at Hunsbury, near Northampton.

A leading feature of the large collection of pottery from Scarborough is the addition of raised horizontal bands to the outside of urns, between the lip and bulge in most instances. These bands are generally impressed with the finger at regular intervals, either with the tip (forming a cup-shaped depression) or obliquely with the finger-nail, in which case the nail leaves a mark at or near the centre of the imprint. Only one example was found with the applied band left plain: many others are slashed (with oblique incisions, as pl. XXI, no. 8), and two bands were applied to certain urns (as pl. XXI, no. 10). That the band did not form part of the original vessel is proved by such specimens as pl. XXI, no 17, where part of the band has come away. This technique dates from the latter part of the Bronze Age (examples of cylindrical form from Park Brow, Sussex, in *Archaeologia*, lxxvi, 15, 16, figs. 1, 3), and appears to have been superseded by similar impressions on the shoulder of the urn (as fig. 23), but the native tradition may have been long-lived, not yielding entirely, either here or abroad, to the earliest Iron Age method of decoration.

Finger-tip ornament on an applied band is found abroad, even in neolithic association, as at Znaim (Moravia) and Křepitz (Bohemia) (*Mittheilungen der Prähistorischen Commission, Wien*, 1897, vol. i, p. 241, fig. 32, and p. 258, fig. 50); but does not appear to have been adopted in Britain till after the introduction of cremation, that is, towards the end of the Bronze Age, when even the cinerary urn with overhanging rim (derived from the food-vessel and ultimately from the neolithic bowl) had gone out of use and given place to the cylindrical or bucket type. This, and other types from Scarborough, except the finest bowls or cups, have particles of limestone (exceptionally flint) mixed with the clay, to give stability in firing; and what is here called grit goes by the name of 'grog' in the modern pottery trade. Like the name of the beverage, this is probably an abbreviation of *grogram*, an English corruption of the French *gros grain*, in the sense of coarse comminuted material.

Fig. 14. Part of bucket-shaped urn with almost complete profile (10½ in.), grey brown above, reddish below, pale greyish inside, rather square lip with bevel inside (0·7 in.), and irregular applied band below it with finger-nail impressions. Small white grit, and pitted surface outside; some mica dust. D. lip, 15 in. From pit 3.

Fig. 15. Part of large urn with brown surface inside and out, darker core with small white grit, inside much pitted; squared lip, and finger-nail ornament on applied band between lip and shoulders. D. lip, 13 in. From area west of Roman ditch.

Fig. 16. Part of large urn, grey and yellow, pitted and rather soapy surface, the paste soft and almost 'corky'; flat expanded lip and finger-nail decoration on applied band. D. lip, 15·8 in. From east courtyard.

Fig. 17. Part of large urn, dark grey throughout, baked hard, with flat expanded lip and finger-nail ornament on applied band on the neck. D. lip, 13 in. From north pit.

Fig. 18. Part of large urn, purplish grey, pitted, with flat expanded lip and finger-nail decoration on applied band; hard paste but rather 'soapy' surface. D. lip, 10·3 in. From pit D.

Fig. 19. Part of large urn, thin hard ware with white grit, dark grey or black outside, pinkish yellow on inner surface; bevel inside lip (0·7 in.) and finger-nail impressions below the lip (perhaps on an applied band). D. lip, 13·5 in. From pit D.

In spite of diligent search, very few bases have been united to their walls at Scarborough; but in one case, about three-quarters of the profile has been recovered with the base (fig. 20), and is given here as probably belonging to the group with applied band of finger-tip decoration. The uncertainty of the curve should be noticed, but the fact remains that many even of the coarser urns from this site are surprisingly symmetrical considering their size and their maker's ignorance of the potter's wheel. The remaining bases worth illustrating (fig. 21) show unexpected variety of form, and vary considerably in hardness and quality: one not figured had a cable-pattern on an applied band round the bottom of the walls, the only fragment of the kind recovered.

Fig. 20. Part of side and foot of urn, yellow brown, pitted, uneven surface, fairly hard. D. foot, 7 in. From pit D.

Fig. 21.

a. Part of foot and side of bowl, soft paste, dark brown outside, reddish inside surface, rather 'soapy'. D. foot, 2 in. From east pit.
b. Hard, rather purplish-brown ware, with smooth surface and black core, very little grit. D. 4 in.
c. Very coarse ware, with black core and yellowish surfaces, pitted, but little grit visible in the paste. D. 5·2 in. From pit R.
d. Coarse pitted ware, almost 'soapy' surface, with irregular indentations just above the bottom. D. 5·7 in. Found above east pit, middle of east side of courtyard.
e. Coarse reddish ware, pitted surface. D. 7·4 in. From south-east angle, inside the courtyard.
f. Purplish-brown ware, pitted, rather 'soapy'. D. 7·4 in. From west end of south berm.
g. Hard brown ware, black inside. D. 4·2 in. From north-east angle of courtyard.
h. Brown ware, pitted surface. D. 4 in. From south berm, middle towards west.
j. Coarse pitted ware, yellowish outside, darker inside, with unsymmetrical profile and uneven inside surface, baked hard, but not of the hardest quality. D. 7·2 in. From pit 2 in west ditch.

The theory advanced to explain the facts at Park Brow, near Cissbury (*Archaeologia*, lxxvi, 10, 14), may be tested by applying it to the pottery from Castle Hill, the broad distinction being that the Bronze Age natives were ornamenting their pottery urns with finger-tip impressions on an applied band of clay, when strangers, bringing Hallstatt culture from the Continent, were impressing the finger-nail on the shoulder of the urn. The rule (to which exceptions are also found at Scarborough) was that cylindrical urns had applied bands, whereas finger-nail decoration occurred on bucket-shaped urns (not far removed in profile from the Bronze Age cylinder) and on better ware with high angular shoulder. The contrast is illustrated in *Archaeologia*, lxxvi, 16, figs. 3, 4.

Reference has already been made to a remarkable fragment from Castle Hill that exhibits both styles of decoration (pl. xxi, no. 9, and fig. 22); and the seeming anomaly may be explained by the retention of native women by the new-comers to make the pottery. It would take some time, and perhaps some pressure to eradicate the traditional style in favour of foreign models; and many fragments show bands with finger-tip or finger-nail impressions applied to vessels of better quality than those used as cinerary urns by the late Bronze Age population of Britain (e.g. the series from Ashford, Middlesex, in the British Museum).

This foreign element, which blended with the native ceramic and finally ousted it, has next to be considered and illustrated. Crude drawings of urns, plain and ornamented in both styles, from Belgian sites, are given in *Annales de l'Académie royale d'Archéologie de Belgique*, liv (1903), 376. The two methods are distinguished in an account of a Hallstatt hut with post-holes on the Spitzberg, near Appetshofen, Nördlingen, in *Prähistorische Zeitschrift*, vii, 72, and fig. 4.

The leading site in Britain for finger-nail ornament on the shoulder of urns is undoubtedly All Cannings Cross. A biconical vase 3½ in. high, with the neck almost vertical, from Somersham, Hunts., is assigned to the Hallstatt period in *V.C.H., Hunts.*, i, 209, pl. 1, no. 6, and the period is further represented on p. 211, figs. 6, 7, 11, by vases of different forms from Woodstone in the same county. Dr. Cyril Fox also illustrates a good parallel to a leading Scarborough type in *Proc. Prehist. Soc. E. Anglia*, iv, 216, fig. 2 A, from a miscellaneous series found at Abington Pigotts, Cambs.: the shoulder is indented and the lip cabled, like fig. 39. Further examples are given in his *Archaeology of the Cambridge Region*, pl. xi, p. 82.

Fig. 23. Part of an exceptionally large urn, light brown ware, baked hard, with slightly cabled lip, uneven (roughly tooled) surface, with 'pinched' ornament forming a ridge on the shoulder. The body is nearly black, perhaps coated inside and out; and
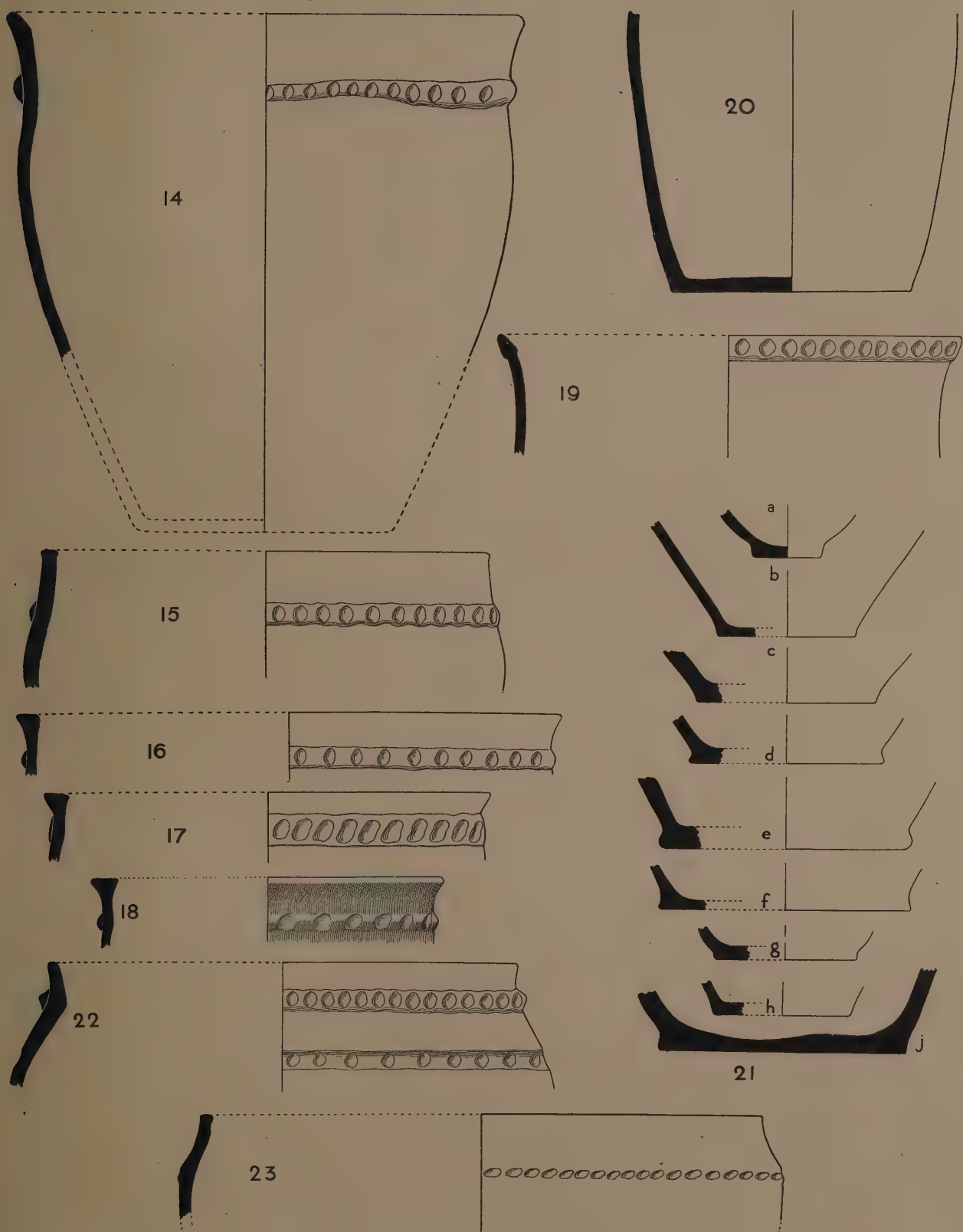
Figs. 14-23. Pottery fragments from Scarborough. (¼)

the walls are thin for so large a vessel.   D. lip, 16·4 in.   The pieces were found in and just outside the north-west pit.

An urn of this character was found in a cist at the centre of a round barrow near Tyning's Farm, on the Mendips, Somerset, and published by the Spelaeo-logical Society of the University of Bristol (*Proc. Spel. Soc.*, 1924, 138, pl. XI, no. 2).   It was 10 in. high and had been used as a cinerary urn, which is some indication that the people who made and used finger-tip pottery in this country followed the late Bronze Age custom of cremating the dead.   This specimen is biconical, but closely allied to the bucket type; a later Hallstatt form, how-ever, was probably derived from a metal prototype (*Mittheilungen der Prähis-torischen Commission, Wien*, 1890, vol. i, p. 70, figs. 66, 67).   Finger-tip ornament on a raised band round the neck of an urn with angular profile from Fechenheim, near Frankfurt, is given in *Prähistorische Zeitschrift*, xi/xii, p. 143.

What may be a later example of this decoration is an urn 12½ in. high with the double 'Hallstatt' curve from the tumulus of La Roche, Dongues (Loire-Inférieure?), illustrated in *Revue Anthropologique*, 1926, p. 330, fig. 1, but not properly noticed in the article, which deals with the Neolithic and Aeneolithic in France.   The illustration is certainly more suggestive of the Early Iron Age, though finger-nail ornament in the body of the urn is known from neolithic hut-sites near Troppau, Silesia (*Mittheilungen der Prähistorischen Commission, Wien*, 1903, vol. i, p. 410, pl. VIII, fig. 11).

The finger-tip and finger-nail methods of decoration have long been recog-nized in Britain, though not till lately have they been distinguished and discussed in relation to the native Bronze Age.   Still more recent is the recognition of an intrusive type with profile in a double curve, characteristic of Hallstatt pottery abroad; and the next group to be considered from Scarborough is clearly of that character, though the bases are more or less conjectural.   The curve, in any case, was probably not so pronounced as on the red-ware and polychrome urns of south-west Germany.

Fig. 24. Restored urn of bold profile, out-turned lip and high shoulder, of smooth grey-brown ware, pitted surface, the interior face blackish, and lip slightly squared. D. lip, 13·5 in.   From pit H.

Fig. 25. Restored urn (lower part conjectural), fairly hard and thin for its size, black above shoulder, reddish below outside, the core and interior black, pitted and of 'corky' quality ; the lip squared and expanded, with slight beading on outer edge.   D. lip, 10 in. H. 10·5–11 in.   From occupied area west of Roman ditch.

Fig. 26. Part of a large urn, black-brown ware, pitted (especially outside) and baked hard, with squared lip and curved neck ; greyish brown, and rather warped in firing. D. lip, 9·8 in.   From west berm, between gate and south-west bastion.
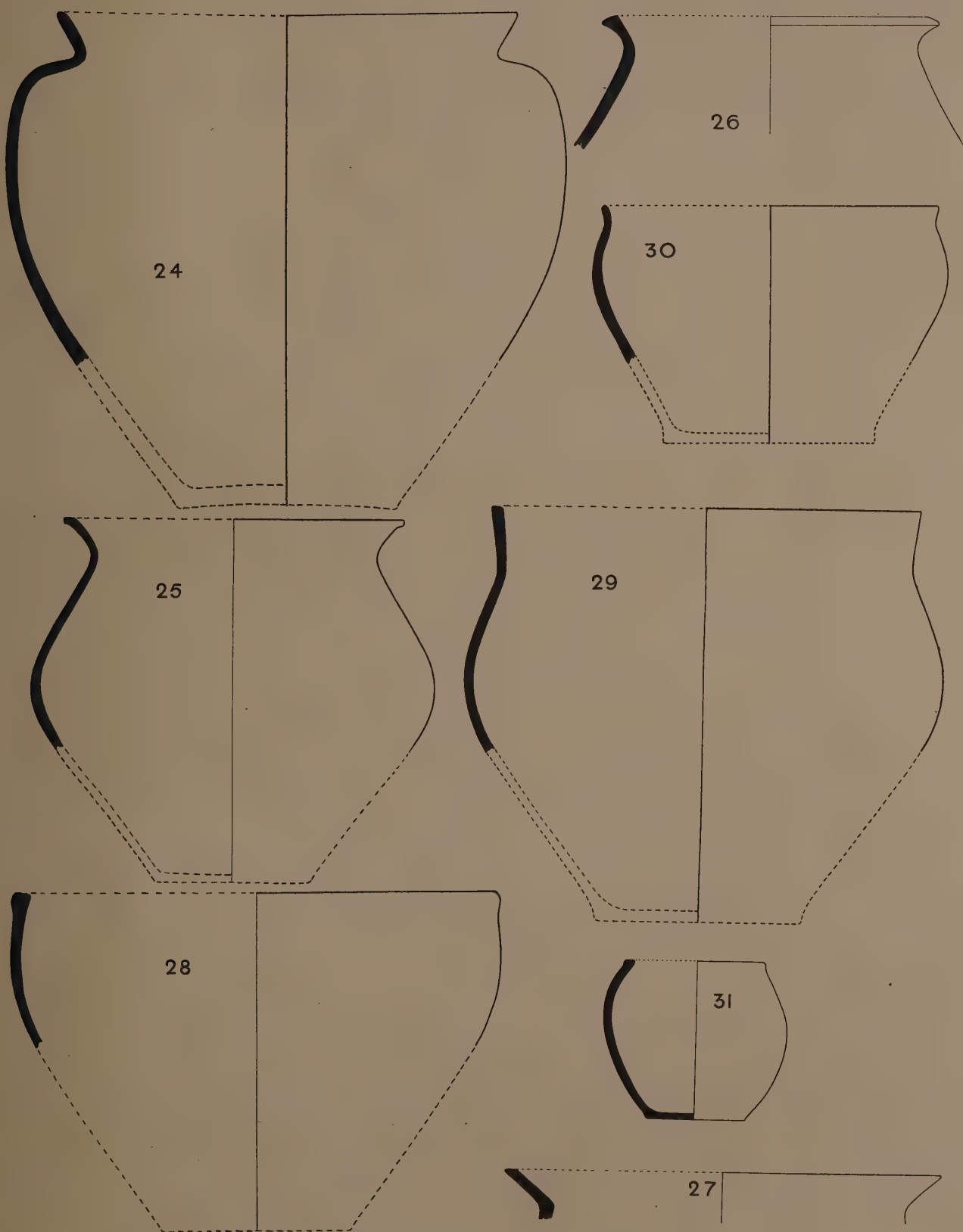
Figs. 24–31. Pottery urns from Scarborough. ($\frac{1}{4}$)

Fig. 27. Part of straight lip of large urn, set at an angle on the neck ; greyish brown, rather soft ware with very fine grit and 'soapy' surface, bevelled on outside edge. D. lip, 12·9 in.   From east pit.
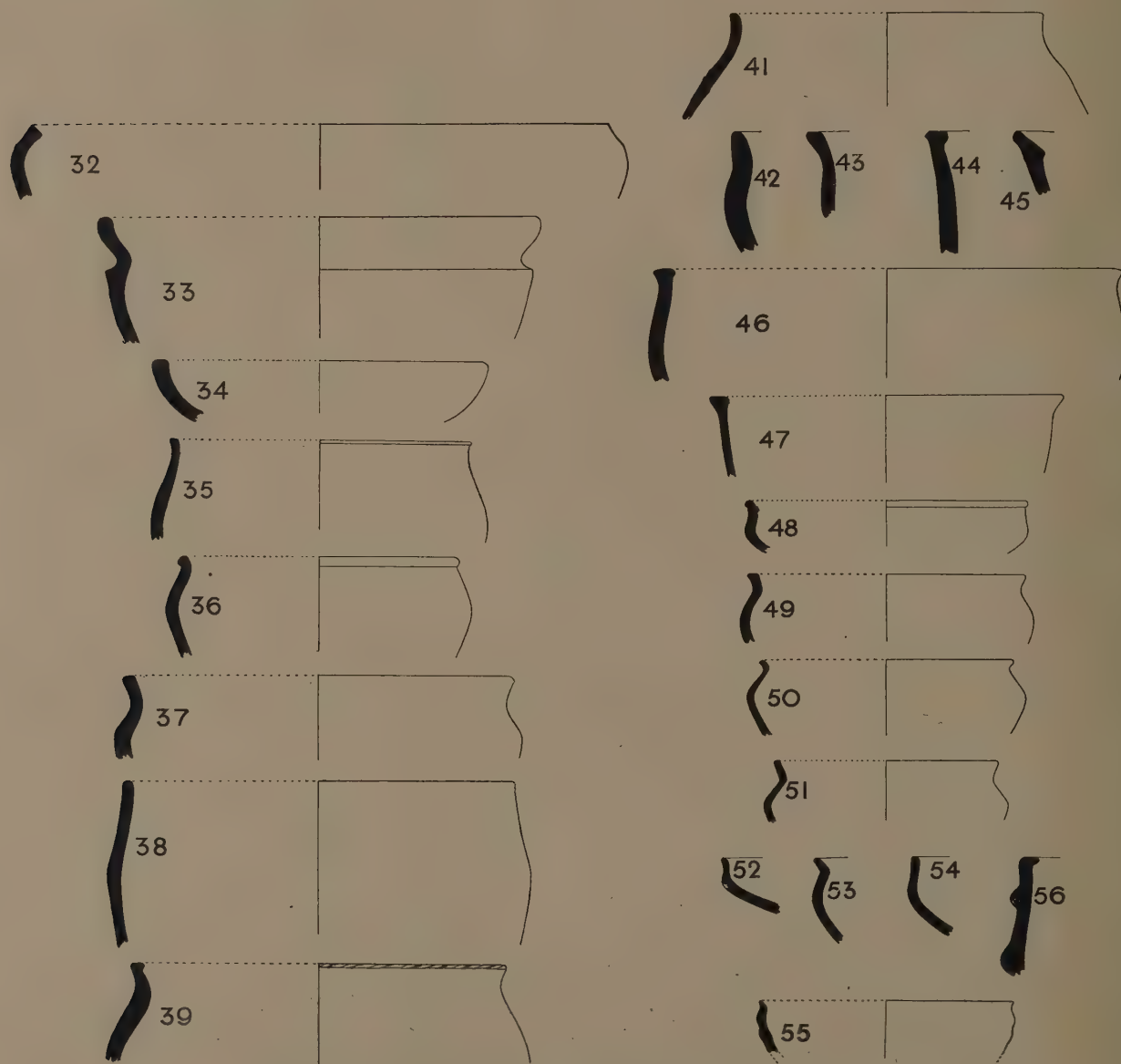
Figs. 32–39, 41–56.   Pottery fragments from Scarborough.   (¼).

Attention has been called to the Hallstatt series in Holland by Dr. Holwerda [1] who thinks the type persisted into the Roman period, and calls it

[1] J. H. Holwerda, *Nederlands vroegste Beschaving* (Leiden, 1907), pls. II, III (with German summary).

Gallo-German. Outlines of some of his figures are reproduced (fig. 40) to show the close resemblance in form to several from Scarborough (and also Park Brow, near Cissbury, *Antiq. Journ.* iv, 353, 355), and there is no doubt that 'urns with rounded profile, more or less bulged, generally with neck at a sharp angle to the shoulder, or with a continuous curve', are ultimately derived from
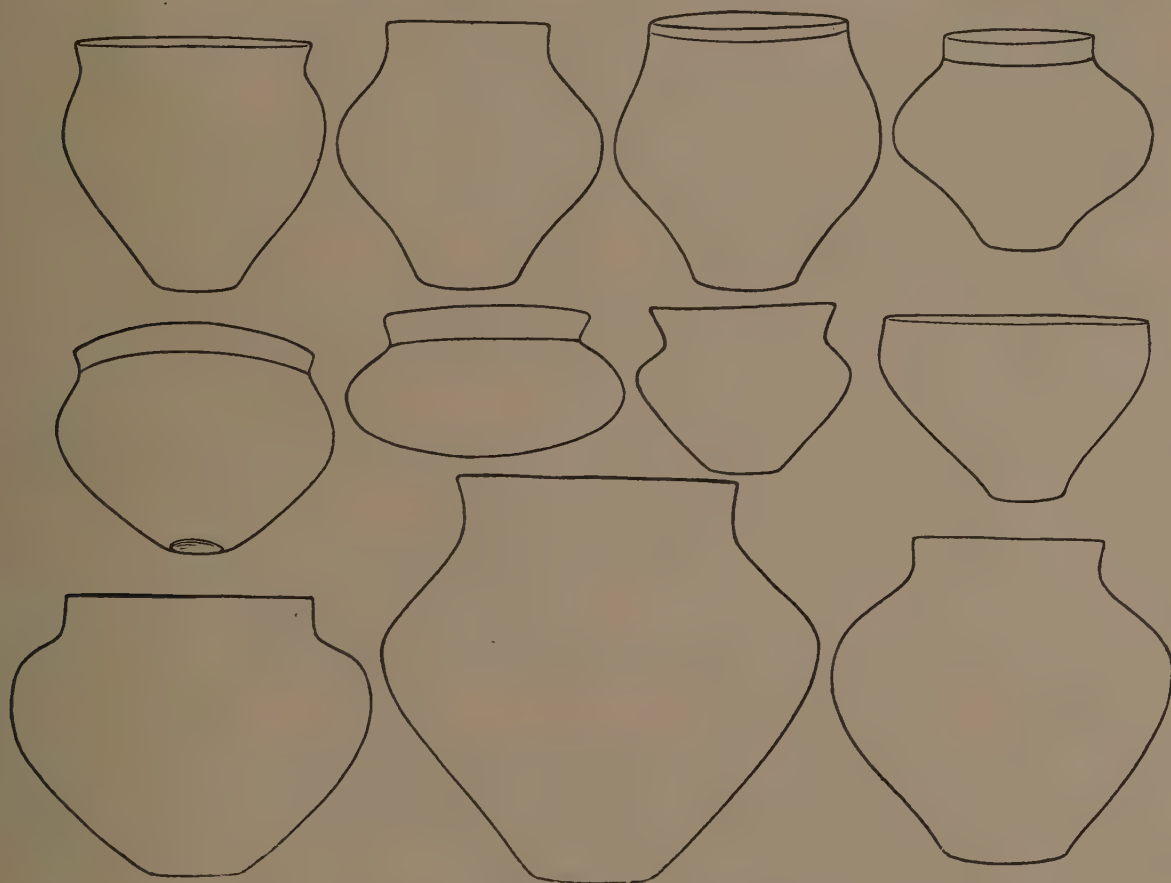
Fig. 40. Pottery profiles of Hallstatt types from Holland (Leiden Museum).

the Hallstatt culture of central Europe. As links between Holland and South-west Germany, discoveries at Weisser Gemeindewald and Hennweiler (Bonn), and Hermeskeil (Trier), are quoted: these sites are briefly noticed in Dr. Schumacher's *Siedelungs- und Kulturgeschichte der Rheinlande*, Band i, p. 103, and in G. Behrens' *Die Hallstattzeit am Mittelrhein* (*Festschrift des Central-Museums zu Mainz*, 1927, p. 152). The orthodox view is given by Rademacher in a paper on Hallstatt chronology of the lower Rhine (*Mannus*, x, 1918, 97) and by Schumacher on Hallstatt culture on the middle Rhine (*Prähistorische Zeit-schrift*, xi, 123).

The peculiar matt-red colour of some Hallstatt pottery is also noticed in Bonn and Leiden; and the occurrence of a decorated Hallstatt vase inside a Bronze Age urn indicates the overlap of the two cultures. These discoveries support the view taken of the Scarborough finds, and show how the profile curve of Hallstatt urns deteriorated in its passage from the Celtic cradle of central Europe, down the Rhine, through the Netherlands to Britain.

Most of the other selected fragments are too small to give much of the profile, but in most cases the rim 'locks' on a flat surface, and enables the 'tilt' to be determined. The next four illustrations are Mr. H. W. Poulter's restorations of the larger pieces, reproducing the most common form of base on Castle Hill (see fig. 21). All these are devoid of ornament, and vary considerably both in profile and fabric.

Fig. 28. Restored urn of 'corky' quality with smooth and pitted surface (vesicular), pinkish grey outside, black core and dark-grey interior; the lip squared and expanded, profile incomplete, the base slightly hollowed. D. lip, 14·5 in. H. 10 in. From pit 4, top level.

Fig. 29. Restored urn (lower part conjectural) of hard and heavy brown ware with rough finish due to included grit, but the surface not pitted; the lip slightly squared. D. lip, 12·6 in. From pit 11, top level.

Fig. 30. Restored urn (lower part conjectural) of thin and hard pale brown ware with exceptional blue grit (flint 'grog'). D. lip, 9·8 in. From pit D.

Fig. 31. Repaired vase, complete but distorted, rough pinkish-brown ware, hard baked with dark grit (possibly flint), squared and rather expanded lip. D. lip, 4·2 in. H. 4·8 in. From bottom of pit 11.

The next eight illustrations are of very hard pottery fragments, perhaps belonging to cooking-pots which would be constantly subjected to supplementary firing in use. Fig. 32 is notable for its size and in-turned lip; fig. 33 is unique from this site; fig. 34 may have had an 'omphalos' base; and the first appearance of the bead-rim may be seen in fig. 36, if not in fig. 48.

Fig. 32. Part of large vessel, very hard yellow ware, with squared lip incurved and mica specks (or similar material), gritty surface. D. lip, 14 in. From east end of south berm.

Fig. 33. Part of roughly made urn, very hard ware, grey-black and brown in places, large cavities left by grit and the surface uneven; the shoulder emphasized by 'pinching'. D. lip, 10·8 in. From east pit, top layer.

Fig. 34. Part of bowl, very hard dark-grey ware, with squared but irregular lip, some white grit. D. lip, 8·2 in. This may have had an 'omphalos' base like fig. 58.

Fig. 35. Fragment of urn, very hard brown ware, roughly squared lip, surface not quite smooth. D. lip, 7·4 in. From the area south-east of the south-west bastion (west end of south berm).

Fig. 36. Part of an urn, very hard ware, greyish brown, with black grit making the surface uneven, and bead-rim.   D. lip, 6·9 in.   From east end of south berm.

Fig. 37. Fragment of very hard brown-black ware, with coarse projecting grit, subangular lip and rounded shoulder.   D. lip, 9·6 in.   From west berm, between gate and south-west bastion.

Fig. 38. Part of large plain urn, very hard, dark brown with large grit giving an uneven surface.   D. lip, 9·6 in.   Same locality.

Fig. 39. Part of heavy urn, grey-black, very hard baked, with cabled rim and large cavities left by grit.   D. lip, 9·2 in.   From east pit, top layer.

In several cases the upper edge or lip of pottery vessels was ornamented, the favourite being a shallow cabled pattern, one example exceptionally deep : there are also circular depressions at intervals of $\frac{3}{4}$ in. (centre to centre) on the squared top, and finger-nail impressions or small notches on the outer edge of the lip.   Hallstatt ware from a house-site at Lochenstein near Balingen, Würtemberg (Bersu and Goessler, *Fundberichte aus Schwaben*, N. F. ii, 94), shows similar lip decoration, and a cabled band applied above the shoulder, also incisions or impressions on the shoulder of other vessels.

Seven examples of miscellaneous character follow, including fragments of what may be described as 'corky' ware, very light in weight, soft and porous, the surface being pitted by the decay of the calcareous grit (or grog) added to the clay by the potter with the idea of rendering the ware refractory : warping in the fire would otherwise have been much more prevalent owing to the large size of many urns used, if not manufactured, on this site.   In four cases here illustrated there is sufficient lip to determine the tilt, but not to give an accurate diameter.

Fig. 41. Part of urn, soft brown, pitted (vesicular), and almost 'corky' ware, smooth surface, darker inside, well potted with small grit, rounded lip.   D. lip, 7·6 in.   From pit 1 in west ditch.

Fig. 42. Exceptionally heavy fragment, brown to black, hard baked with fairly large grit.   Found above east pit, middle of east side of courtyard.

Fig. 43. Fragment of large urn, hard baked, grey outside, pinkish-brown inside, surface coarsely pitted, squared and cabled lip.

Fig. 44. Fragment of large urn (D. lip about 12·8 in.), coarsely pitted ware, pinkish brown inside and out, with squared and expanded lip, medium hardness.

Fig. 45. Fragment of large urn, dark brown, finely pitted, rather 'corky' (light weight), with shallow cabling on lip ; medium hardness, rather 'soapy' surface.

Fig. 46. Fragment of purplish-brown ware, pitted and almost 'corky', with spread and slightly convex lip.   D. lip, 11·4 in.   Found above east pit, middle of east side of courtyard.

Fig. 47. Fragment of purplish-brown ware, fairly soft, free from grit, squared and expanded lip.   D. lip, 8·6 in.   From pit 1 in west ditch.

The next seven fragments are of softer ware, of various colours and profiles, some being large enough to give the diameter of the mouth, but in no case is the profile complete, and with such a variety conjectural restoration is out of the question.   What may rank as a bead-rim is seen on the first of this list, and reference may also be made to figs. 25 and 36, as early examples of a feature common in the succeeding period of La Tène.

Fig. 48. Part of bowl, soft grey ware with darker surface, angular shoulder and rounded lip, almost a bead-rim.   D. lip, 6·9 in.   From east courtyard.

Fig. 49. Part of bowl, pinkish-brown ware, much pitted inside, with thickened lip and rounded shoulder.   D. lip, 6·8 in.   From west berm, between gate and south-west bastion.

Fig. 50. Part of bowl, mostly brown, thin hard ware with uneven surface, out-turned lip and angular shoulder, rather pitted on the outside.   D. lip, 6·2 in.   From east pit, top layer.

Fig. 51. Part of bowl, thin and hard ware, slaty brown, with rather sandy paste; angular lip and shoulder.   D. lip, 5·5 in.   From east pit, top layer.

Fig. 52. Part of open bowl, soft ware, rather soapy, pale brown, pitted inside.

Fig. 53. Part of bowl, slaty brown, smoothed surface with angular lip and shoulder. From pit 14.

Fig. 54. Part of bowl or cup, grey-brown ware, with slight bevel inside lip and rather angular shoulder; the paste fine and somewhat sandy, baked hard.

The fragments photographically reproduced are intentionally mixed to give a comprehensive survey of the Castle Hill series; and a few notes follow on foreign parallels for certain items on pl. xxi.   In view of the short duration of the Hallstatt settlement on Castle Hill, it may well be that the smaller and finer vessels were brought from the Continent, and only the urns and cooking vessels manufactured on the spot by native potters under new masters.

Plate xxi, no. 1. Part of urn, soft pitted ware, yellow outside, almost black inside, with four shallow horizontal grooves.   From west berm, between gate and south-west bastion.

Plate xxi, no. 2. Part of a bowl or vase with out-turned lip and sloping indentations below the neck; pale brown, smooth paste without grit, and slightly soapy surface. D. lip, 8·6 in.   From east courtyard.

Plate xxi, no. 3. Part of large urn with squared and slightly cabled lip, greyish brown, with large cavities (perhaps ornament) in horizontal line and the surface much pitted; sandy surface, hard baked.

Selected pottery fragments, Scarborough (⅔)
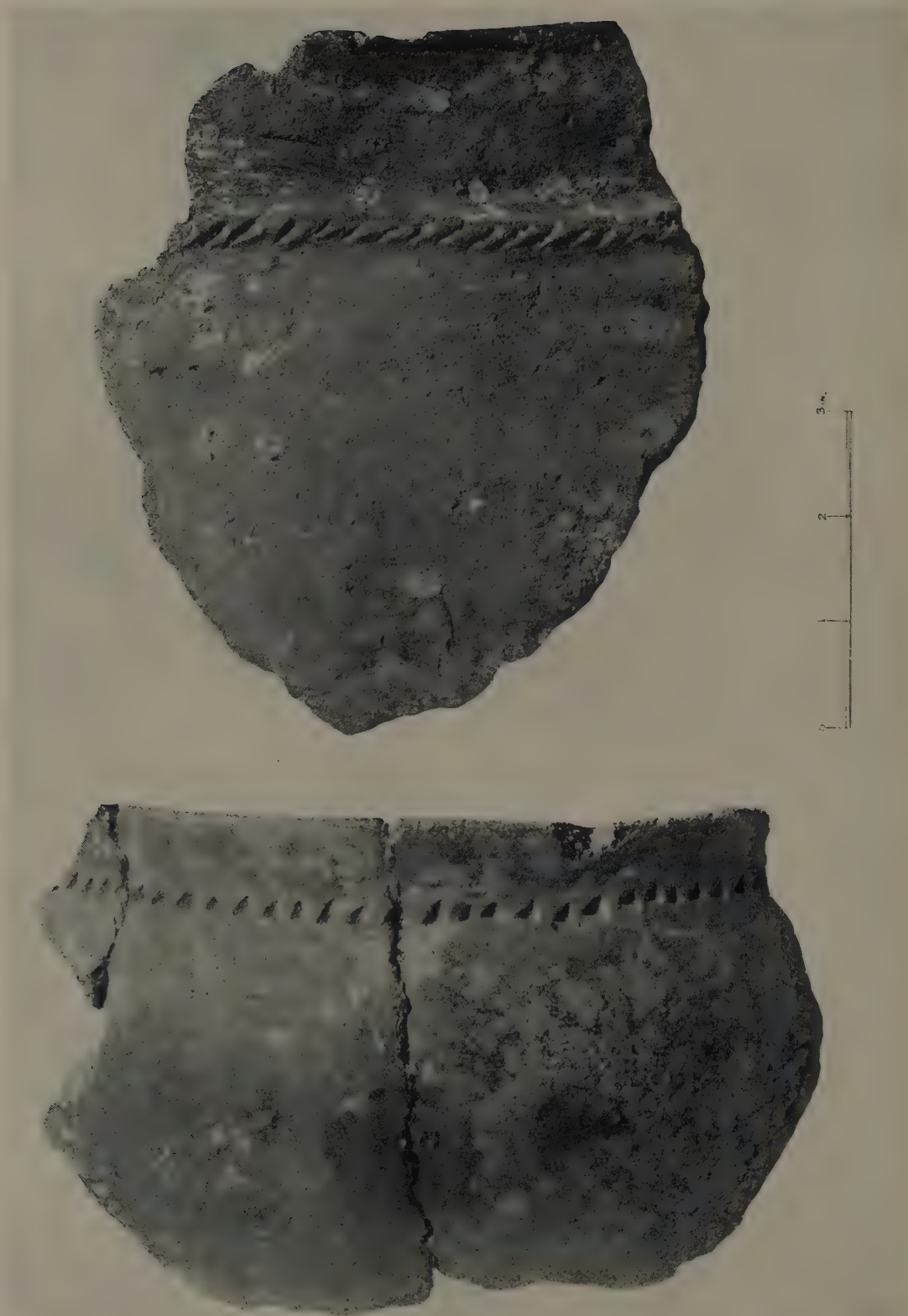
Pottery fragments of Hallstatt date from S.W. Germany

Plate xxi, no. 4. Part of urn, dark grey, much pitted inside, 'corky' ware with flat expanded lip, and applied band with finger-nail impressions below.

Plate xxi, no. 5. Part of cup or vase, hard grey ware with rather soapy surface, and three horizontal grooves enclosing diagonal slashes below the lip. D. lip, 5·3 in. From east pit, top layer.

Fig. 55 and Plate xxi, no. 6. Part of cup or bowl of pale brown to black ware, thin lip bevelled inside and three broad horizontal grooves outside ; rather soapy surface, and fine soft paste. D. lip, 6·2 in. From west berm, between gate and south-west bastion.

Plate xxi, no. 7. Part of large urn, with rounded shoulder, much pitted inside and out, rather soapy, soft ware, approaching the 'corky' quality.

Plate xxi, no. 8. Part of urn, very hard gritty ware, greyish brown, pale yellow inside, with out-turned lip and slashed band applied to shoulder. From north-west pit.

Fig. 22 and Plate xxi, no. 9. Part of urn, very hard, gritty ware, pinkish outside, yellowish inside, with deep bevel inside lip of $1\frac{1}{2}$ in., an applied band below the lip with finger-nail impressions, and similar impressions in the body at the shoulder level; coarse grit, white and bluish. From east pit, top layer.

Fig. 56 and Plate xxi, no. 10. Part of urn, pale yellow, hard gritty ware, with ledge inside lip and two slashed bands applied below lip and on shoulder level. From pit A.

Plate xxi, no. 11. Part of bowl with out-turned lip like no. 2 but with more 'soapy' surface, smooth and soft light brown ware with some large grit, black inside; notched below the lip. D. lip, 5·6 in. From west courtyard.

Plate xxi, no. 12. Rim fragment of soft reddish ware, much pitted on the outside, slashed outside the bevelled lip. From east end of south berm.

Plate xxi, no. 13. Part of cup or bowl, hard reddish-brown ware, with sandy texture, bevelled lip and five shallow horizontal grooves below ; mica or similar lustrous spots.

Plate xxi, no. 14. Omphalos base of hemispherical cup, of ware like no. 6, soft yellowish brown, finely pitted, with rather 'soapy' surface ; thickest round the depression (not the side of a vase).

Plate xxi, no. 15. Rim-fragment of large urn, exceptionally hard and heavy, dark grey and yellowish, with large grit not weathered out ; rounded lip.

Plate xxi, no. 16. Part of large urn, very hard and gritty with red and yellow palettes, finger-nail impressions on upper raised band, but perhaps in the body of the urn below (like no. 9). From south berm.

Plate xxi, no. 17. Part of urn dark grey almost 'corky' ware, with deep bevel inside lip (0·9 in.), and applied band (part missing) on shoulder with finger-nail impressions ; pitted on both faces. From east courtyard.

Plate xxi, no. 18. Part of urn lip with bosses on applied band below (left by finger-nail impressions) ; very hard, gritty ware, squared lip, ashy grey.

Fig. 57, no. 1. Part of neck of large urn, incised with rectangular panels, the larger being bordered with chevrons; greyish brown ware, fairly hard, smoothed surface rather sandy, inside face very pitted.   From east pit, top layer.

Fig. 57, no. 2. Part of vase, slaty grey, fine hard ware, the lip bevelled inside and filled triangles incised on the neck.

Fig. 57.   Decorated fragments of pottery, Scarborough.   (¼)

Fig. 57, no. 4. Similar to last but not belonging to the same vase; lip bevel more pronounced, and surface more pitted.

Fig. 57, no. 3. Similar pattern on small fragment of softer soapy ware, much pitted.   From west berm.

Separate sections of nos. 6 and 10 on the plate are given as being exceptional.   The internal shelf at the mouth of the urn, with two slashed bands, is peculiar (fig. 56); and enough remains of the rim of the fine grooved cup or bowl to give a diameter at the mouth of 6·2 in. (fig. 55).

To illustrate no. 14 on the plate, two full-size drawings are given (fig. 58) of hemispherical bowls or cups in the British Museum.   The omphalos base of

the larger is an exact parallel to the fragment photographed; and that of the smaller specimen matches another fragment from Scarborough, with the edge of the depression slightly protruding. This type is common in the Hallstatt period, e. g. at Nierstein on the Rhine above Mainz (*Festschrift des Central-Museums zu Mainz*, 1927, p. 140); and there are many others from Saxony in the national collection. The 'kick' (omphalos) in the base also occurs at All Cannings Cross (Mrs. Cunnington's pl. 44, no. 5 and pl. 28, nos. 1, 2, 5, 6, see p. 32) and at Hengistbury Head, where Mr. Bushe-Fox duly noted its continental affinities (*Report*, p. 36).

Hallstatt influence is obvious in such vessels as fig. 24; and two parallels
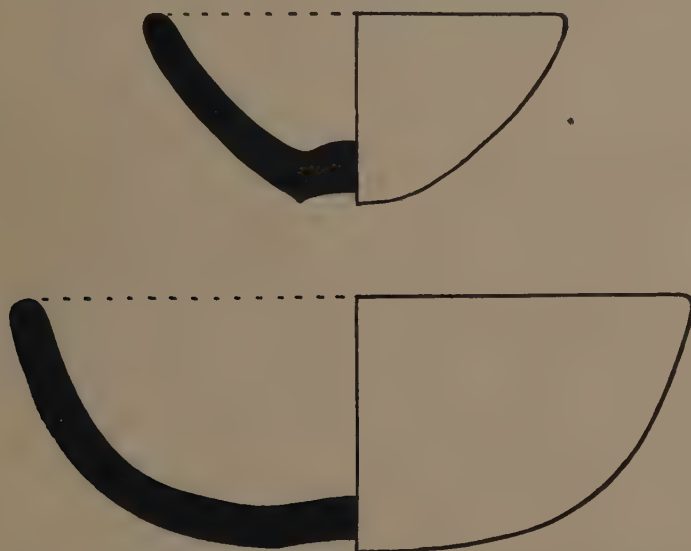
Fig. 58.   Two pottery bowls of Hallstatt date, Lower Lusatia, Germany.   (⅓)

for the decoration are selected from the British Museum collection from graves of that period in south-west Germany (pl. xxii). Above is a hard redware fragment of a very large vessel from Liptingen, Baden, with large grit, showing the lip as well as the slashed band applied to the neck much like pl. xxi, nos. 8, 10. The lower figure on the plate is part of a vase with a diameter at the lip of 8½ in. The ware is red with very fine grit and smoothed surface, the neck having a row of markings not unlike the oblique impressions of the butt end of a lead pencil. This specimen comes from the grave of a child in a barrow on Saubühl, Jungnau, Hohenzollern, and may be compared with pl. xxi, no. 11.

The lip of fig. 57, no. 1, is too imperfect to give an exact diameter, but it was approximately 17 in. in diameter at the constricted neck; and the incised decoration consists of panels in the Hallstatt manner bordered inside with zigzag lines that are akin to specimens from All Cannings Farm, Wilts.

(Mrs. Cunnington's pls. 33, 34, and 47 *a*, no. 2).   Hatched triangles are of more frequent occurrence and are common on the overhanging rims of Bronze Age cinerary urns in Britain. The present examples (fig. 57, nos. 2–4) may have been imported ready-made, being of exceptional quality ; but parallels for the decoration may be seen in *All Cannings Cross*, pls. 34, 35, and 44.

Handles may be considered rare at Scarborough.   One perfect example is a loop of circular section with an oval opening of 0·4 in., the ware being soft and pitted, with light-brown surface outside ; the handle is not inserted but applied to the surface and reinforced, probably in a vertical position.   Another fragment, of similar ware, consists of about half of a much larger handle and thinner wall, applied in the same manner vertically.   A somewhat harder fragment with sandy surface and rounded lip has a protuberance beginning ½ in. from the lip that may be the stump of a similar handle, in which case it was certainly vertical.   The diameter outside the lip would be about 4½ in.   A handle or lug found at All Cannings Cross (Mrs. Cunnington's pl. 37, no. 2) is of similar form except for its tang for insertion in the vessel's side (as in Bronze Age ware from Park Brow, *Archaeologia*, lxxvi, 16) ; and vertical handles are shown on vessels from the same site (*ibid.*, pl. 38), in both cases fixed vertically.

In view of the special conditions at Castle Hill, little stress can be laid on the distribution of the fragments, though the more important pieces have been carefully located, and a large number of sketches made showing sections of sherds.   The most prolific source was the East Pit, especially its top layer, and several were deemed worthy of illustration (figs. 21 *a*, 22, 33, 39, 50, 51, 57 nos. 1, 2 and 4, and pl. xxi, no. 5).   Here rough kitchen ware, baked very hard, was associated with large vessels with incised ornament and soapy surface, also thin, well made cups, carinated or incised—another argument for a single date for the series.   Pit D was also interesting, yielding as it did a foot still attached to a side 8 in. high (fig. 20), three varieties of the applied band (figs. 18, 19, and like pl. xxi, no. 8), all on different wares. From the East Courtyard came two selected pieces of rather soft and soapy urns with applied bands (fig. 16 and pl. xxi, no. 17), together with a carinated bowl fragment (fig. 48) and another of good quality with oblique impressions (pl. xxi, no. 2).   Variety again is seen in the series from the west berm, between the gate and south-west bastion—hard gritty kitchen-ware (fig. 54), better ware with out-turned lip (fig. 26), part of a pinkish bowl or vase with soapy surface (fig. 49), and two ornamented pieces (pl. xxi, nos. 1, 6).   Both plain and impressed bands applied above the shoulder of urns were found in the occupied area west of the Roman ditch.

The parallels cited for the pottery (apart from the bronzes which may be contemporary, but are familiar as native Bronze Age forms) are recognized as belonging to the Hallstatt period, roughly 800–400 B. C.   The richest area for

these ceramic forms is south-west Germany, and the culture seems to have reached Britain by way of the Rhine. Along that river periodical changes are well marked, and the succession of characteristic types can be seen, for example, in *Altertümer unserer heidnischen Vorzeit*, v (Mainz, 1911): pl. 44, early Hallstatt; pl. 3, Hallstatt pottery with everted rims; pl. 55, pottery of Hallstatt II; pl. 50, La Tène I; pl. 51, La Tène III; and pl. 70, late La Tène and Roman Empire. These plates show nothing to contradict the conclusions drawn from the Scarborough material; and the same can be said of Déchelette's chapters on the pottery of both periods of the Early Iron Age (*Manuel*, ii, pp. 809, 1458). If more precision is desired, it may be added that the restored pottery is more like that of the middle Hallstatt period than early or late, to judge from Rademacher's classification in *Mannus*, Ergänzungsband iv, pls. xi, xii, see p. 127; and the intrusive German (Teutonic, as opposed to Celtic), noted on his pl. xi, may perhaps be recognized in two urns from Weybridge illustrated in the *Antiquaries Journal*, v, 75.

In this connexion a recent statement by Dr. Rademacher in Ebert's *Reallexikon*, v, 27, may be quoted as authoritative. 'The barrow culture of the Hallstatt period in eastern France was a western continuation of the contemporary and similar Hallstatt area of south Germany. . . . In France the pottery especially did not reach the same level as in south Germany. . . . The carriers of the south-German and French Hallstatt culture were Kelts, and developed the culture of La Tène in the sixth and fifth centuries, B.C. The barrow-people of the lower Rhine certainly belonged to the Keltic stock (different in every respect from the German), and gradually retreated westwards, to merge finally in the Keltic culture of the Marne.'

It is sometimes said that the Bronze Age people were the first Aryan inhabitants of Britain, though early Bronze Age burials are unburnt, and cremation (which has been called *le rite Aryen par excellence*[1]) did not become general much before 1000 B.C. Philologists contend that the Kelts were later still, and now that a Hallstatt period seems to be established for Britain, and Hallstatt culture is by some authorities identified as Keltic, it may be that the strangers who dug the pits on Castle Hill, made pottery at Eastbourne, and settled on the South Downs at Park Brow were the earliest Keltic people in these islands, and began a series of momentous developments.

The warning may be repeated that the date of the settlement on Castle Hill is based on the theory that it lasted only a few years. The pottery certainly comprises some Hallstatt forms, and there is nothing in the remainder to prove another period; but in rubbish pits objects of intrinsic value are of rare occurrence, and more definite evidence might have been expected from the habitations

[1] *L'Anthropologie*, 1904, 331.

or burials[1] of the new-comers, but these have not been located and there is a limit to excavation on the site. Much, however, has already been accomplished by Mr. Simpson with the active support of the Corporation of Scarborough, who will no doubt see to it that these relics which constitute a chapter of local history are soon exhibited for all to see in a museum worthy of the town and of a great archaeological discovery.

DISCUSSION

Mr. F. G. SIMPSON exhibited and explained a series of lantern-slides showing the excavations on Castle Hill, the distribution of the pits containing the pottery, and their relation to the fourth-century Roman signal-station.

Mr. GORDON CHILDE appreciated the exhibits which were the result of a painstaking excavation, and had followed with interest the alleged succession of events on Castle Hill. The paper had raised more points than he could deal with, but a sight of the pits reminded him strongly of the Bohemian Kulturgruben of the Knoviz stage, which had contained human bones, and suggested cannibalism. Were human remains mixed with the rubbish in the Castle Hill pits? He also inquired if there was any difference in the potsherds found at different levels, separated by layers of clay. The pots recalled those of the German urn-fields which covered a long period, and gave a possible clue to the area from which the strangers came to Scarborough, Holland being more likely than any country more to the south-west.

Dr. WHEELER recognized from the slides that the excavations had been systematically conducted, and congratulated Mr. Simpson on the results obtained. The finger-impressions characterized an interesting group of pottery, of which Scarborough was the northern limit. In Scotland and round the Irish sea there was a derivative type not found in southern England. The cordons ended where the incrusted urns began, the former belonging to the extreme end of the Bronze Age, though abroad the type was found at many periods. Its occurrence in association with Hallstatt forms, which might be identified with Rhenish specimens, would provide a starting-point for the earliest Iron Age of Britain. It was curious that so many Hallstatt sites had been found in Britain during the last few years, and that the pottery was different on all of them, which suggested a number of small invasions or migrations from different continental areas within a small space of time. In his opinion Scarborough would become a typical site for Hallstatt pottery.

Mr. SIMPSON replied that human bones had been found in the second level on the first laminated bed, consisting of a child's skull and an adult's humerus. Sir Arthur Keith had the material in hand, but attached little importance to the find, as it was extremely difficult to isolate the medieval burials on the site.

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[1] There is reason to think that these would be cremations : such was the contemporary practice on the Rhine, and burnt human bones were found in a 'Hallstatt' urn at Park Brow (*Antiq. Journ.*, iv, 355, no. 14). There are cinerary urns of cognate forms in the Cinquantenaire Museum at Brussels from Biez (near Cocroux), Ryckevoisel, and Wuestwezel (near Antwerp).

VIII.—*St. Augustine's Abbey Church, Canterbury, before the Norman Conquest.* By
C. R. PEERS, *Esq., C.B.E., F.B.A., Director, and* A. W. CLAPHAM, *Esq., F.S.A.*

Read 11th March 1926

THE paper which we have to lay before the Society marks a stage in, we will
not say the end of, a long story. The exploration of the site of St. Augustine's
Abbey, Canterbury, has now been proceeding for over twenty-five years, and
writing in 1901 on a group of early churches connected with St. Augustine's
mission, one of us expressed the hope that his own church of St. Peter and St. Paul,
and that of St. Mary built to the east of it a few years later, might one day be
added to the list of those of which actual remains have come down to us.[1] This
hope is now happily fulfilled, even more completely than we had reason to
expect, and the occasion is one for congratulation to antiquaries generally, but
particularly to the bursar of St. Augustine's College, our Fellow the Rev. R. U.
Potts, who has superintended the work for the last thirteen years, and to whose
devotion and unremitting energy its success is chiefly due.

When in June 1915 the late Sir William Hope gave to the Society an
account of the progress of the excavations on the site of St. Augustine's Abbey
at Canterbury,[2] he was able to point to the discovery of the remains of the
porticus in which St. Augustine himself and his successors in the see of Canter-
bury had been buried, and of the lower courses of the octagonal building added
by Abbot Wulfric in the eleventh century. Since that time it has been possible
to continue the examination over the whole extent of the Norman church, and
we are to-day in a position to set down as much of the architectural history
of the site as we are ever likely to know.

Well known as is the story of this religious house, it may be well to recall
it briefly, for the sake of completeness.

The Venerable Bede, in his *Ecclesiastical History of the English People*, tells
us that Augustine and his companions, on their first arrival at Canterbury,
were installed in the church of St. Martin, to the east of the city. After King
Ethelbert's conversion he gave them a place within the city suitable to their
rank, which may be taken to be on the site of the present cathedral church.
Augustine also built a monastery outside the walls, not far from the city to the
east, and in it, by his counsel, Ethelbert erected from the foundations and

[1] C. R. Peers, in *Arch. Journ.* lviii, 402.   [2] *Archaeologia,* lxvi, 377.

endowed with various gifts the church of the blessed Apostles Peter and Paul, in which the bodies of Augustine himself and all the bishops of Canterbury and the kings of Kent might be laid. This church, however, Augustine did not consecrate, but his successor Lawrence. Augustine died in 604, and his body was buried close to the church of the blessed Apostles Peter and Paul, outside the building, because it was as yet neither finished nor dedicated. But soon when it was dedicated he was brought inside and buried in the north porticus in a fitting manner; in which were also buried the bodies of all the succeeding archbishops except two only, namely Theodore and Berctwald, whose bodies were buried in the church itself, because the porticus could not take any more. This porticus has almost in the middle of it an altar dedicated in honour of the blessed pope Gregory, at which on every Saturday their services are solemnly celebrated by a priest of that place.

To the east of the church of St. Peter and St. Paul stood a smaller church, built about 620 by King Edbald, son and successor of King Ethelbert, and dedicated in honour of St. Mary.

The porticus of the archbishops, having received the bodies of six arch-bishops, could hold no more, but was afterwards enlarged northwards, and in this enlargement were laid, at a much later date, the bodies of St. Mildred and Abbot Adrian. Its discontinuance as the burying-place of the archbishops must date from the time of Archbishop Cuthbert, 741–758, who provided a building to the east of his cathedral in order, among other things, that suc-ceeding archbishops should be buried there.

Documentary history fails us from this time till the tenth century, when there is a record in Thorn's Chronicle that in 978 the church was dedicated by St. Dunstan in honour of St. Peter, St. Paul, and St. Augustine. Such a dedi-cation should imply considerable structural alterations.

The next stage is to be found recorded in the chronicle of Gocelin, a monk of St. Augustine's. He tells us that Abbot Wulfric, who was appointed in 1047, had conceived the idea of joining up the church of St. Peter and St. Paul to that of St. Mary. He obtained leave from Pope Leo IX, and began the work by destroying the east end of the greater church, and the western part of St. Mary's, with the porticus by which it was surrounded, and by removing the burials from that part of the monastic cemetery which lay between the two buildings. He then started on the new work, building walls, columns and arches, to the joy of all beholders, but we are at the same time told that the lack of skill of the workmen made the place unsuitable for a monastic building. The mutilation of St. Mary's church brought on him the displeasure of the Blessed Virgin, and he died in 1059, leaving his work unfinished. His successor Egelsig did nothing to it, and in 1070 the first Norman abbot, Scotland, wishing to enlarge the church,

found himself in serious difficulties. The inconvenient plan of Wulfric's work, and the narrowness of the building, made it impossible to contrive any reasonable scheme of enlargement, if the old buildings were to be retained. The older parts of the church, moreover, were ruinous, but remembering Wulfric's fate, he was afraid to adopt any scheme which would entail the removal of St. Mary's chapel. However, being sent to Rome on an embassy, he obtained the leave of Pope Alexander for a complete rebuilding, and returning home began the work by destroying Wulfric's unfinished walls, and after removing from St. Mary's chapel the remains of those who had there been buried, he threw it down also, and so obtained a free site on which his new church could be set out.

At the time of his death in 1087 the eastern arm and transepts had been set up, and so much of the nave begun as brought the new work up to the place where St. Augustine and his successors lay buried.

Their removal to a fitting position in the great new church thus became an urgent matter, and fortunately for us so notable an event found its contemporary chronicler in Gocelin. The whole story of the translation of the relics by Abbot Wido in 1091 is set forth in ' The book of the translation of St. Augustine the apostle of the English and of his Fellows ', written about 1097, and now MS. Cott. Vespasian B. xx. in the British Museum. The account is that of one who was actually present at the scenes he describes, and gives so minute a description of the arrangement of the porticus that when its remains were once more brought to light twelve years ago, the three empty tombs against its north wall could be identified with absolute certainty as those in which the archbishops Laurencius, Mellitus, and Justus had been buried in 619, 624, and 630 respectively. The full account and description given in Sir William Hope's paper already mentioned, to which the reader is referred,[1] makes it unnecessary to deal with this aspect of the subject on the present occasion.

The plan of the buildings, as existing at the time of the Norman Conquest, must now be examined (pl. xxx). The oldest part consists of a church with a nave 39 ft. by 27 ft., having a narthex or vestibule of its full width at the west, and flanked on either side by chambers, of which one is the burial-place of the archbishops, and as this is clearly an integral part of the plan, the church can be no other than that begun by King Ethelbert during St. Augustine's lifetime, and finished soon after his death. The archbishops' porticus is 28 ft. by 12 ft., and opposite to it, on the south side of the church, are the scanty remains of the porticus in which Queen Bertha and king Ethelbert were buried. It is 5 ft. shorter from east to west than the other ; to the west of each porticus is another chamber extending as far as the west wall of the church, of which nothing more can be said.

[1] *Archaeologia*, lxvi, 377.

It seems clear that these chambers were separated from the nave of the church by solid walls, as the door leading into the archbishop's porticus is mentioned by Gocelin, and in the account by Bede of the burials of Theodore and Berctwald *in ipsa ecclesia*, because the porticus was full, the structural separation is emphasized. Such walling as remains is built of Roman brick, 1 ft. 9 in. thick, set in a hard pebbly mortar. The floors were of plaster coloured pink by an admixture of pounded brick, and in the nave of the church the greater part of the area retains its floor (pl. XXIII, fig. 1). There was a doorway from the church to the narthex and another, flanked by buttresses, from the narthex to the open air, or one may perhaps say, into the forecourt. The side walls of the church are completely destroyed by the sleeper walls of the Norman nave, and everything east of the line of the east walls of the porticus has been obliterated by the building of Wulfric's octagon. One piece of evidence alone remains, that the north wall of the archbishops' porticus was continued eastwards, and the significance of this will be discussed later.

We have then before us a good part of the plan of a church of the end of the sixth century, and must now try to illustrate it from other examples. The English evidence may conveniently be taken first. The church of St. Martin at Canterbury, to the east of the city and of the site of the abbey of St. Augustine, was given by King Ethelbert to his queen Bertha, who was a Christian and daughter of King Charibert of Paris. It was a condition of her marriage to Ethelbert, who was a pagan, that she should be allowed to observe the rites of her religion, and a Christian bishop, Luidhard, accompanied her to Kent. The church of St. Martin, says Bede, was built of old while the Romans still occupied Britain—a statement which it is difficult to accept in reference to what now exists; but that some part of what we now see was standing when Augustine came to Britain it is reasonable to believe. An examination of its plan, ignoring later medieval additions, shows it to consist of a nave and chancel, both of early date, but with the chancel older than the nave. It has walls 2 ft. 2 in. thick, built of Roman brick, and is 14 ft. 4 in. wide. At 18 ft. east of the existing chancel arch are evidences of a return, marking the line of the original east wall, from which it is conjectured that an apse projected. On the exterior of the south wall a buttress of brick marks the end of the early masonry, and to the west of this buttress are, first, an inserted but probably Saxon doorway, and then a blocked opening 3 ft. 3 in. wide with brick jambs and a stone lintel, which perhaps replaces an original arch. This gave access to a small square building on the south of the chancel, the bonding of whose east and west walls is to be seen, though the walls themselves have perished. A little red plaster flooring is said to have been found here. No trace of a similar building exists on the north side of the chancel. Excavations made in the nave by the late Canon

Routledge proved that the side walls of the chancel continued westward beyond the line of the east wall of the nave, thus showing the chancel to be earlier than the nave. The nave is 38 ft. by 24 ft., with thin walls, built of chalk and ragstone blocks with courses of Roman brick irregularly set, and has pairs of buttresses
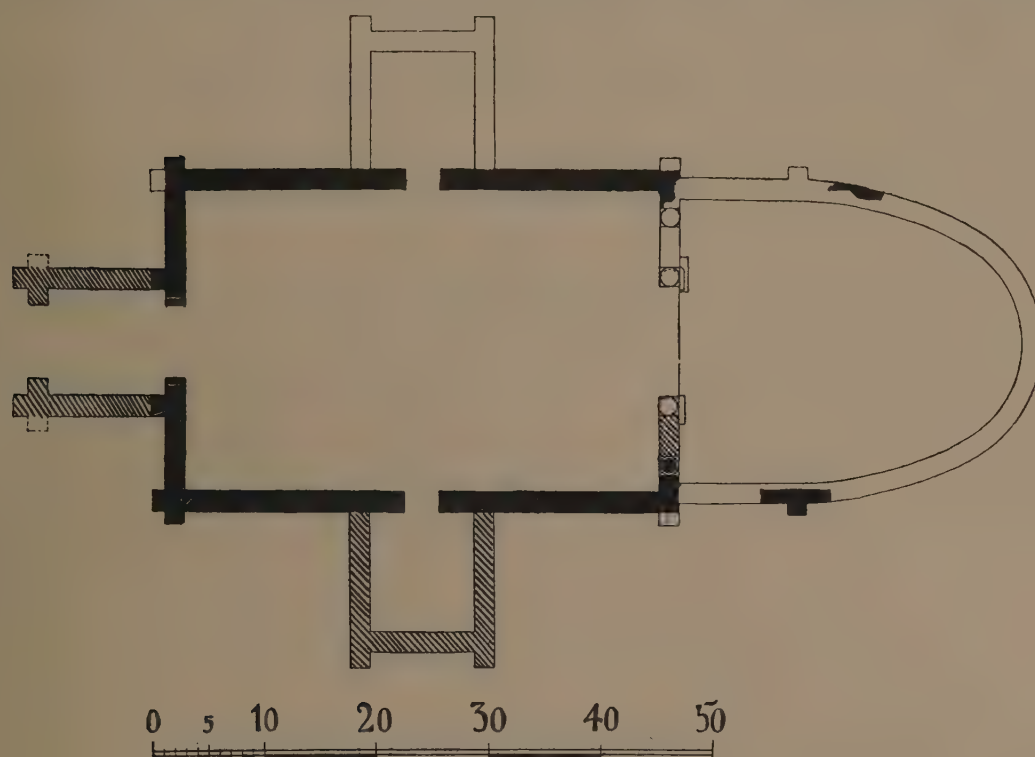
Fig. 1. St. Pancras, Canterbury : ground plan.

at its angles and a buttress midway in its south wall. It may have had a western porch, but there is no trace of buildings on north or south (plan, *Arch.*, LXXVII, 244).

The church of St. Pancras, Canterbury (fig. 1), due east of the church of St. Augustine's Abbey, and between it and St. Martin's, has walls 1 ft. 10 in. thick, built of Roman bricks in a pebbly mortar, and consists of a nave 42 ft. 6 in. by 26 ft. 6 in., opening to an apsidal chancel 22 ft. wide and some 28 ft. from east to west. Between nave and chancel was a colonnade of four Roman columns, the space between the middle pair being 9 ft. wide, and spanned by a brick arch, while the side openings are 4 ft. wide, and probably had lintels. They were blocked with brickwork at what seems an early date. There are brick buttresses at the springing of the apse and at the four angles of the nave. The west door of the nave opens to a porch 10 ft. 6 in. by 9 ft. 4 in., and on the south side of the nave is a chamber of precisely the same internal dimensions; and it may be assumed that a similar building existed on the north of the nave. There is no

mention of this church in Bede, nor indeed till Thorn's Chronicle, which is of fourteenth-century date. In that there is a story that St. Pancras's church was originally a pagan temple, used by King Ethelbert, but consecrated by St. Augustine in honour of St. Pancras; and that this was the first church he consecrated in Britain. In the south porch was an altar where he used to celebrate mass, where formerly the statue of the king had stood. The tradition must go for what it is worth, but in view of the early character of the building should not be neglected.

At Lyminge in Kent a monastery was built by Ethelburga, widow of King Edwin of Northumbria and sister of King Edbald of Kent, about 633. She
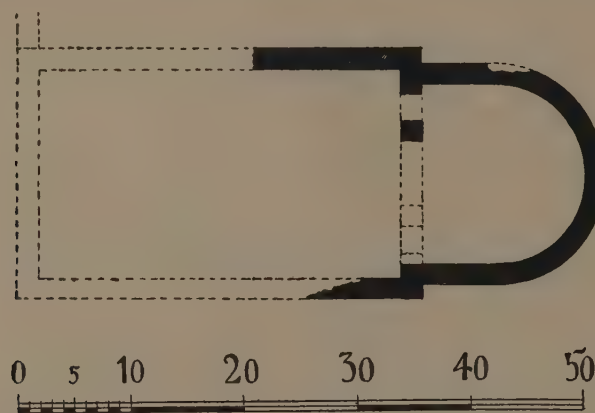
Fig. 2.   St. Mary, Lyminge : ground plan.

died there in 647 and was buried in the north porticus of her church. To the south of the present church of Lyminge are the foundations of a small rectangular building, with a stilted apse, the walls of Roman brick being 1 ft. 10 in. thick (fig. 2). There is some evidence that the wide opening from nave to chancel was filled by a central archway and narrower side arches, and that there were rectangular chambers north-east and south-east of the nave, overlapping the east wall of the nave and the west part of the chancel.

The chapel of St. Peter on the Wall, at Bradwell, Essex, is built across the line of the wall of the Roman coast fortress of Othonae, on the south side of the Blackwater estuary. Bede, in his account of St. Cedd's mission to the East Saxons, c. 653, says that he made churches in various places, especially in the city which in the Saxon tongue is named Ythancaester on the bank of the river Pent.

The nave of the chapel of St. Peter measures 54 ft. by 26 ft., and had at the east an apse, which opened to the nave through brick arches on rectangular piers—the spacing suggesting that there were two rather than three of these arches. North-east and south-east of the nave were small rectangular chambers

overlapping the chancel, and at the west end a porch.   There are pairs of
buttresses at the western angles of the nave, and there have been others on the
north and south sides (plan, *Arch.* LXXVII, 248).

The materials of the building, taken no doubt from the Roman fort, are
Roman brick, septaria, and various freestones.   This building has so many
points of resemblance to the Kentish group, that the record of a seventh-century
origin raises a strong presumption of an early date for it, even if it be not the
original church built by St. Cedd.

At Reculver, within the walls of the Roman coast fortress of Regulbium,
a minster was built by Bassa the mass-priest in 669.   The old church of Reculver
remained in use till 1805, when on account of its distance from the houses of the
village it was abandoned and a new church built further inland.   The old church
was then dismantled and in great measure pulled down, but enough remains
to-day to show the plan of the earliest building, and to trace the additions made
subsequently.   It had an aisleless nave 24 ft. wide, with rectangular chambers
north-east and south-east overlapping the apsidal chancel.   Between chancel
and nave were three equal arches in Roman brick, springing from round stone
columns with capitals and bases of unskilful classic detail, which are now in the
Infirmary cloister at Canterbury Cathedral.   The walls were built of flint and
stone rubble, with bands of Roman brick, and the floor of the church was of
pink plaster (plan, *Arch.*, LXXVII, 245).

Of these five buildings, four being in Kent and one in Essex, four occupy
sites which have seventh-century histories, and all have certain characteristics
in common, which they share with Augustine's church of St. Peter and St. Paul.
Recorded dates of building extend over seventy years, and go to show that the
type of plan, whatever its origin, was established in south-east England at this
time.

Augustine's church, it must be remembered, was a building of much impor-
tance, designed to be the burial-place of kings and archbishops, and we may
assume that it would be finer than most of its contemporaries.   As regards its
west end, the narthex or vestibule which preceded the nave is not found amongst
the early churches just described, and the west porches of St. Pancras's and
Bradwell are far less pretentious.   At the east, on the analogy of the examples
quoted, it may have had an apse opening by a triple arcade to the nave, and
overlapped at north-west and south-west by rectangular chambers ; but another
solution is possible, namely that a transept may have intervened between nave
and apse, giving what is known as the tau-plan (fig. 3), a far more imposing treat-
ment.   Such a plan may be seen in the early church of St. Denis, near Paris, and
a simpler form occurs in the two early churches at Romain-Moutier, of seventh-
and eighth-century date.

It is interesting in this connexion to compare the plan of the presumably early church at North Elmham in Norfolk, where the transept has to the west of it small chambers very like the Canterbury porticus. A bishop's seat was set up at Elmham in 670. For details and probable dates see Messrs. Clapham and Godfrey's paper in *Antiq. Journ.* vi, 402.
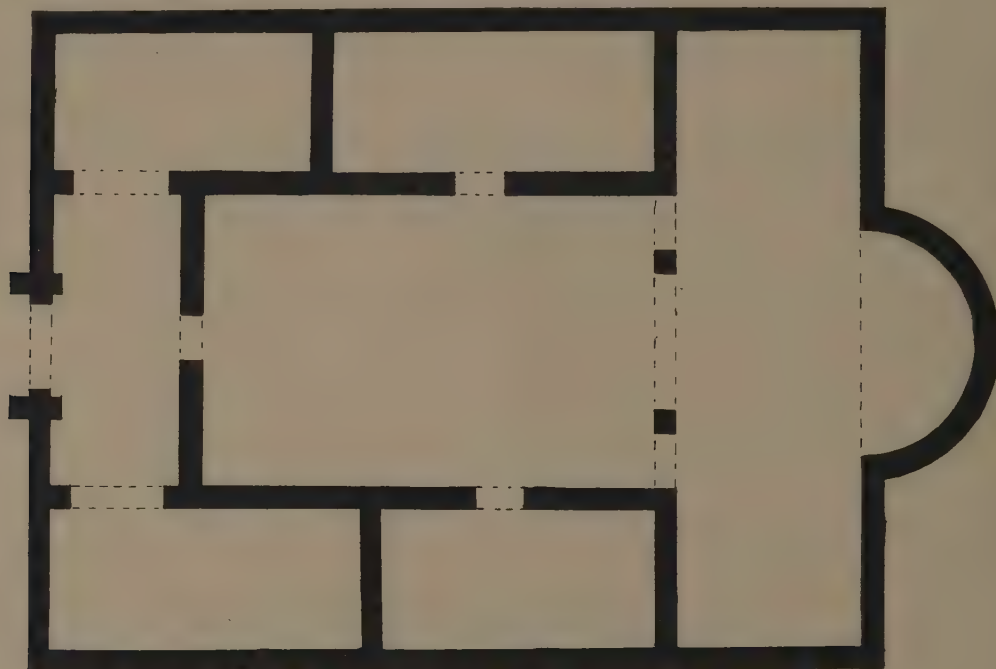
Fig. 3.   SS. Peter and Paul, Canterbury : suggested original plan. $\frac{1}{24}''$ scale.

We do not wish to insist on the next example as proof of the form of the east end of Augustine's church, but it has a claim to be cited. On the last leaf of Royal MS. 15 A. xvi (Brit. Mus.), containing Latin poems of the ninth and tenth centuries, a book formerly in the library of St. Augustine's Abbey, is a pen drawing of a church with eastern apse and transepts, a nave with aisles, and a tower apparently at the north-west. Two other towers are embellishments by a later hand. That this is a drawing of the church of the monastery to which the MS. belonged is more than it is proposed to assert, but it is at any rate a commentary on our suggestions (fig. 4).

The mention by Bede of the tradition of a Roman origin for St. Martin's church at Canterbury must always be kept in mind, when dealing with these early times. That some Roman Christian churches should have survived the heathen invasions of the fifth and sixth centuries is quite likely, and such may even have been in existence in Canterbury when Augustine came. The first

cathedral of Canterbury is said to have been made of old within the city by the work of Roman believers, and to have been reconsecrated by Augustine; and Bede, in his *Life of St. Vedast*, records that the saint, going to Arras, made it his first business to discover and reconsecrate the abandoned church of the Roman Christians. Only one building in Britain now remains, and that only in plan,

Fig. 4. Drawing of a church (Brit. Mus., Royal MS. 15 A. xvi).
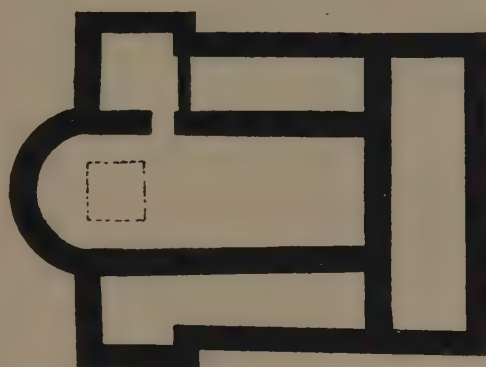
Fig. 5. Christian church, Silchester: ground plan.

which can claim to be a Christian church of Roman date, and that is of course the little church at Silchester (fig. 5). Its resemblances to St. Augustine's church are too striking to be passed over; its nave with apse, transepts, and porticus, with the narthex at the entrance to the nave, proclaim its kinship, and nothing is more likely than that the missionaries of the Christian revival should seek, by copying the features of older churches, to demonstrate the continuity of the faith.

The subdivision of the opening between nave and chancel, which occurs in at least four of the early churches which have been discussed, has the advantage of throwing the whole width of the chancel open to the nave, while avoiding the excessive height and thrust of a single arch in such a position. Its expedient is natural, but is clearly from another tradition than that of the simple nave and chancel churches common in all parts of Britain and Ireland, where the opening between nave and chancel is narrow, and often extremely narrow. The 'basilican' plan, in which the apse, and eastern transept where it exists, are thrown open to the nave in fullest measure, offers a more obvious analogy, and we shall hardly be wrong in looking on these churches as aisle-

less basilicas, with the eastern apse developed in importance, and provided with lateral chambers to give altar space which would otherwise be lacking. In Reculver and Bradwell the position of these adjuncts cannot fail to recall the prothesis and diaconicon flanking the eastern apse, which from the fourth century at least, on the evidence of the Syrian churches, were normal to the Christian basilica. But there is no ground for assuming such a use in English churches. An early example from Kefr Finsheh, in northern Syria, is worth citing in illustration, as showing the column screen between nave and transept.

To sum up, we may say that there seems no ground for the idea that Augustine's church was directly inspired from any church in Rome itself— where indeed nothing closely resembling it has yet come to light—but that it takes its place in a class of which there is more than one survivor in England, and as is only natural, we may assume analogies with contemporary churches in Gaul. It was built to fulfil rather special requirements, and it is of more profit to verify its arrangements than to seek for their precise derivation.

The first enlargement which seems to have been made is that of the archbishops' porticus, and since the burials of archbishops at St. Augustine's presumably ceased after the building by Archbishop Cuthbert between 741 and 758 of a special burial-place near his cathedral church for himself and his successors, it may be assumed that the enlargement had been made before that date. And seeing that Archbishops Theodore and Berctwald were buried on the north side of the nave of the Abbey church, and that Archbishop Tatwin was also buried elsewhere than in the enlarged building, it would appear that the enlargement was not made by the time of the death of the latter in 735. This building can therefore be fairly closely dated, and its foundations, which have been uncovered within the lines of the present cloister, show it to have had pairs of buttresses at its angles, and another on its north wall. We have already seen that buttresses occur not uncommonly in the early churches we have been considering, but after the seventh century they go quite out of use, and down to the time of the Norman Conquest they do not reappear. This seems an additional reason for putting the enlargement of the porticus soon after Tatwin's death. If so, this would mean that it was never actually used as the burial-place of the archbishops, and this may well have been the case; otherwise it is difficult to understand why it was possible in later days to put St. Mildred and Abbot Adrian in such important positions in this porticus as they seem to have occupied.

The next additions may probably be referred to the time of the reconsecration of the church in 978 by St. Dunstan. At this time it appears that the east wall of the original narthex was pulled down and its area added to the nave,

Fig. 1. Augustine's church, looking east

Fig. 2. Tombs in western tower

Fig. 1. Second narthex : foundations of west wall

Fig. 2. Second narthex : monolith in foundations of west wall

while a larger narthex, of the full width of the nave and aisles, was added to the west. A forecourt of equal width, and 68 ft. in length, was laid out to the west of the narthex, and into it, opening by two doorways from the narthex, projected an oblong porch or vestibule, containing a flight of steps, and having in front of it a second flight descending to the level of the ground in the forecourt. At the west end of the forecourt was a gateway tower, which contained a chapel of St. Mary. That all this work is of one date it is impossible to say—the development of a forecourt might well have taken place before the tenth century, even as early as Augustine's days, and the question is complicated by that of the cloister. St. Augustine's was a Benedictine monastery, and though we cannot assume that a cloister formed part of its original lay-out, since there is no evidence that the characteristic claustral plan had been evolved at the time, there may well have been a four-square cloister by the tenth century, somewhere to the north of the church as is the present cloister. This is, however, a matter for further examination, and judgement must be deferred till a complete account of the monastic buildings is undertaken. The gateway tower at the west of the forecourt is full of graves (pl. XXIII, fig. 2), and in this connexion it is instructive to note that Abbot Scotland, when pulling down St. Mary's chapel, transferred the remains of those bishops and abbots who had there been buried to the western tower of the monastery, laying them before the altar of St. Mary there. With them were removed the remains of four kings —Edbald, Lothair, Wihtred and Mul—with their queens and their children, who had also been buried in St. Mary's. The original entry seems to have been only 14 ft. wide, but it was widened at some time, and burials have taken place over and beyond the sites of its south and west walls. It was perhaps at the time of the widening that it was carried up as a tower, and the chapel may have been on the first floor of the tower, while burials were made in the actual entry beneath. For burials in such a position compare the account of St. Swithun's grave at Winchester.

Little can be said of these added buildings, but the megalithic nature of their foundations is characteristic of their presumed date. One great sandstone shaft (pl. XXIV, figs. 1 and 2), $9\frac{1}{2}$ ft. long, and tapered, with a socket hole in its top, but otherwise quite plain, has now been removed and set up near by. Next to it was a great sand-stone boulder, which, when taken out, was found to have on its underside a number of grooves made by the sharpening of knives or other metal tools on it; these must of course have been made before its use as a foundation-stone in the tenth century.

Of St. Mary's chapel, built by King Edbald about 620, little can be said, but the width of its nave was little less than that of King Ethelbert's church, and the mention of the destruction by Wulfric of the porticus, by which it was

surrounded, suggests that it had a narthex at the west, and chambers on north and south ; indeed its plan was probably much like that of the older buildings. Its only surviving fragment, its west wall with a central doorway, is built of Roman brick, like the other early buildings ; the arrangement is like that of the west wall of Augustine's nave, but the doorway had an external rebate.

These thin walls, built solely of Roman brick, occur only in these two churches, in St. Pancras's and the older part of St. Martin's. They imply an abundance of Roman brick, a fact which in itself suggests an early date, apart from the presumption on historical grounds. The thin walls, 1 ft. 10 in. to 2 ft., are natural for brickwork, and may help to explain the thinness of later walls built in rubble by Saxon workmen.

Up to this point there cannot be said to be anything abnormal in the architectural history of St. Augustine's Abbey Church. But in the eleventh century a very remarkable and abnormal scheme, which joined the church of St. Peter and St. Paul to that of St. Mary, was adopted by Abbot Wulfric. His predecessor, Abbot Elmer, seems to have meditated something of the kind, involving a transference of the remains of the early archbishops, as he is said to have removed some of the adornments of their tombs and placed them in the cloister. But to Wulfric is due the idea of the building, circular within and octagonal without, which we must now consider.

Wulfric's Rebuilding

Before proceeding to a detailed examination of the architectural features of Wulfric's rotunda, it will be well to inquire into the character of such buildings in general, and to see how far such characteristics are reflected in the structure under review.

In western Christian architecture, buildings of the central type of plan— circular, polygonal, square or of Greek-cross form—have served three main purposes—as a tomb-chapel, as a baptistry, or as a church ; its adoption as a type of church plan would seem to be an eastern form, which was not introduced in the west before the sixth century. In the Constantinian age the first two uses appear side by side in the west, and all three in the east. Well known examples of this age may be cited in the church of the Holy Sepulchre, Jerusalem, a tomb-chapel, the first baptistry of St. John Lateran, Rome, and Constantine's church of St. Peter at Antioch. Since that time, all over western Europe, the type has been from time to time reproduced, the construction of Charlemagne's tomb-chapel at Aachen marking an important revival of the custom, which had many imitators.

In England the earliest church of the type of which we have any record, was that of St. Mary at Hexham, built by St. Wilfrid early in the eighth century. This
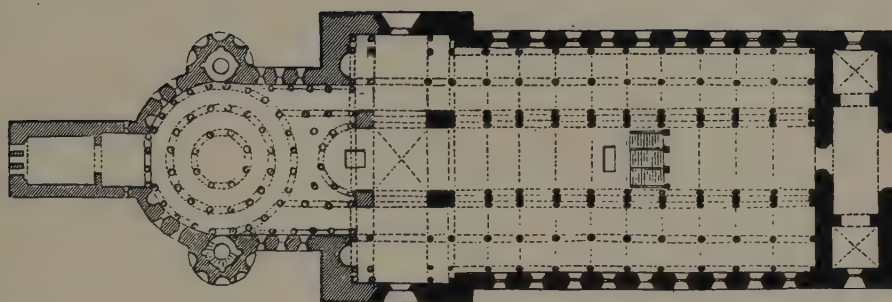
Fig. 1. St. Benigne, Dijon. Plan of eleventh-century church : after Plancher

Fig. 2. St. Benigne, Dijon. Section of rotunda and eastern chapel : after Plancher

Fig. 1. St. Benigne, Dijon. Lowest stage of rotunda (as restored)

Fig. 2. St. Benigne, Dijon. The rotunda in the eighteenth century

Fig. 1. Rotunda and site of Augustine's church, looking west

Fig. 2. Wulfric's rotunda, looking west
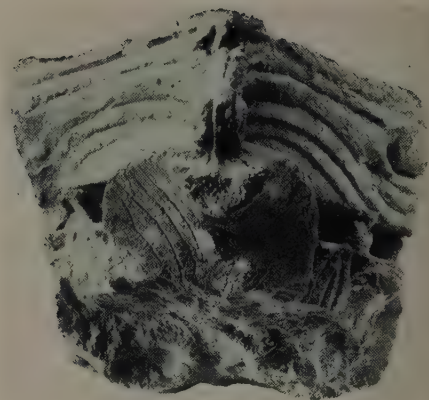
Pre-Conquest details found on the site

was followed, at a long interval, by King Alfred's church at Athelney, a variant of the square type of plan, built about 900, by Athelwold's round church at Abingdon, built about 960, and by a round tomb-chapel built at Bury St. Edmunds some time during the tenth century. To these may be perhaps added the baptistry at Canterbury Cathedral, of the precise form of which we are ignorant.

It is, however, to a foreign example—St. Benigne at Dijon—that we must turn for the immediate inspiration of Wulfric's work at Canterbury (pls. xxv and xxvi). St. William of Volpiano, the builder, was born in 961, and was educated at the monastery of St. Mary and St. Michael near Vercelli. In 990 he became abbot of St. Benigne, and shortly after he proceeded to reconstruct the sixth-century church of the abbey on a much larger scale. The great basilica of St. Benigne consisted of the main church with transepts and double aisles, the rotunda with a double aisle, and a square-ended chapel to the east. The possible sources of the plan of the rotunda may include the church of St. Stefano Rotondo at Rome, perhaps reconstructed in 467, and the abbey church of St. Sophia at Benevento, built by the Lombard duke Arechi (591–641); both of these churches have a rotunda with a double aisle, and the latter was a reputed copy of St. Sophia, Constantinople. The first stone of St. Benigne was laid in 1011; the main church was consecrated in 1016 and the rotunda in 1018. It was perhaps the greatest church of its age in France. The columns were brought from abroad by the diocesan bishop Bruno of Langres, but the carved capitals, of surprisingly crude workmanship, have been recognized as the product of local art. The rotunda was destroyed in 1792, with the exception of the lowest stage, below the ground-level, which has since been restored to use. When complete, it consisted of three stages, one below ground and two above, each of the same plan; the aisles formed double triforia, but the central space was carried up and roofed with a domed cupola. The second stage or first floor of the aisles was level with the main church, but the ground-stage formed a crypt. Flanking the rotunda, and rising above it, were two great circular staircase-towers.

St. William of Volpiano died in 1031, but during the latter part of his life he was called in to reform a number of important monasteries in various parts of France, including the abbeys of Jumièges, Fécamp, and St. Germain, Paris. His own reputation and that of his great church would consequently be still a recent memory when Abbot Wulfric visited Reims in 1047, and though there is no evidence that Wulfric himself visited Dijon, the resemblances between the rotunda there and the building which Wulfric subsequently began at Canterbury are so striking that a close connexion between the two buildings cannot be doubted. The general plan of the three parts of the building, the flanking staircase-towers, and the sinking of the lowest stage of the rotunda below ground-level, are all reproduced in the English example. The rotunda at Dijon was

copied on a smaller scale, and with one aisle only, by abbot Amédée at Flavigny about 1030.

The remains of Wulfric's building prove conclusively that his scheme included not only the rotunda, but the reconstruction, as at Dijon, of the main church as well. It is, in consequence, reasonable to suppose that the main purpose of the new rotunda was the more honourable housing of the bodies of St. Augustine, of his canonized successors, and of Ethelbert and his wife, which would all have been displaced by the rebuilding of Augustine's church. The rotunda thus takes its place in the category of tomb-chapels.

The building operations of Wulfric began by the pulling down of the east end of the church of St. Peter and St. Paul and the west end and porticus of the church of St. Mary, and the cleansing of the cemetery between the two buildings. So far the records; the actual remains show that the main west wall of St. Mary's church was left standing, but that the whole of the rest of the site was cleared and excavated to a depth of some 2 ft. 8 in. below the floor-level of Austin's church. A solid platform of rammed chalk was then laid down over the whole area, and on this were laid the foundations of the new building. The walls are of ragstone rubble, built evidently by entirely capable masons, and set out with an exactitude and precision which could hardly be improved upon; the internal surfaces were roughly rendered in mortar. The rotunda, as originally planned, was a building 54 ft. in internal diameter, circular within and octagonal without and having an inner circle composed of eight piers, forming an aisle. The sides of each pier are lined radially from the middle of the building, and the inner and outer faces are slightly curved (pl. XXVII). Several of the piers show signs of the nascence of an outward curve in the last surviving stones at the top (some 5 ft. above the chalk floor), which seems to indicate a series of barrel-vaults over the aisle and between the piers, and having a groined intersection opposite the openings. The main central space shows no traces of a roof at this level, and it was no doubt intended to carry it up the full height of the building, as at Dijon. The outer faces of the octagon, where they stood free from the adjoining buildings, were each provided with a pilaster buttress, $4\frac{3}{4}$ ft. wide; remains of two of these buttresses were found. The lowest floor or crypt of the rotunda was approached by a central opening $9\frac{1}{2}$ ft. wide in the west wall, and consequently in the middle of the east end of Austin's nave. In the thickness of this opening was a ramp of rammed chalk indicating the former existence of a staircase from the earlier church down to the crypt of the rotunda.

During the erection of the rotunda an alteration was made in the design, indicating not only some fear for the stability of the structure, but also an after-thought in the provision of two large staircase-towers. The alterations consisted

Fig. 1. Staircase on NW. side of Wulfric's rotunda : looking east

Fig. 2. Staircase on NW. side of Wulfric's rotunda : looking west

of the addition of an outer skin of masonry 2 ft. thick to the main walls of the rotunda and the further addition of a massive semicircular foundation on the south side, evidently intended to contain a large spiral staircase in the upper stages. It is extremely probable that a corresponding staircase tower was added also on the north side, but here the presence of the later walls precluded an examination. The various sections of this work were apparently added piecemeal, as they are normally separated by a straight joint.

It is unnecessary to insist on the close analogy between the staircase-towers at Dijon and those at Canterbury, but it may perhaps be pointed out that such towers were a feature of the buildings of that and the previous age, which followed the Carolingian tradition and were generally abandoned in those buildings which followed the later Norman or Touraine forms. A somewhat similar form of structure is to be seen in the added pre-Conquest staircase-turret at Brixworth and in the remains of the staircase-turret at North Elmham. The form of the superstructure of Wulfric's building is uncertain; the mention by Gocelin of columns seems to imply that in the main story these replaced the solid piers of the stage below, but beyond this everything is pure conjecture, and it is not known precisely how far the building had advanced before the work was finally abandoned. The small museum at the college contains three carved capitals which present all the salient features of the Roman Composite order, with the details in an advanced stage of degradation (pl. xxviii). It would be interesting to connect these capitals with the unfinished portions of Wulfric's work, but a comparison with similar work surviving in France would seem to favour an earlier date. The capitals in the crypt at Flavigny have certain features in common with the Canterbury examples, and these are ascribed to the latter part of the eighth century; in England they more probably belong to the tenth, for here the attempted revival of classical forms, which distinguishes Carolingian art, had little chance to express itself before that period.

The junction of Wulfric's work with the earlier work to the west was evidently left in a transitional state when the new building was abandoned. The existing angle of Wulfric's work outside the south-east angle of St. Martin's porticus shows that it was intended to reconstruct the whole of the body of the main building on a larger scale, with an internal width of about 70 ft. as against the 55 ft. of Austin's building. The width of 70 ft. is so large as to imply a transept at this point rather than a nave, and a suggested restoration of the plan on the lines of the church at Dijon is shown in fig. 6. This restoration provides a much needed explanation for the mass of masonry in the angle between the rotunda and the main church. No signs of the suggested apse appear in the surviving work, but this is hardly standing to the probable floor-line of the projected church. The mass of masonry on the north side was

utilized as the base of a broad staircase of stone steps, of which the lowest remain in position; these steps are set on a slight curve and were at first mistaken for the foundations of an apse (pl. xxix). A fuller examination has, however, placed their purpose beyond reasonable doubt. They must have formed a communication between the monastic buildings and the main story of the rotunda. Between this staircase and the east wall of the enlarged porticus of St. Gregory was an inchoate mass of large blocks of stone indicating either a temporary or a subsequent filling of an awkward space.

It is no part of the present paper to deal with the rebuilding of the church by the Norman abbots Scotland and Wido, but it may be mentioned in conclusion that the Norman church was designed to include the sites of all the pre-existing buildings from the church of St. Mary on the east to the western tower. These limits were closely followed at the west end, and this may serve as some indication of the extent of St. Mary's church towards the east, where Scotland's crypt has effectively abolished all trace of the earlier building. The Norman masons everywhere cut through the earlier foundations for the foundations of their own walls, but elsewhere the earlier work was suffered to remain below the Norman floor-level.

It remains to remark briefly on such slight evidence as exists of the arrangement of the cloister and its surrounding offices before the Norman rebuilding. The earliest definite record of the four-square cloister characteristic of monastic houses is to be found in the plan of the monastery of St. Gall, drawn up early in the ninth century; and the contemporary letter describing the plan gives grounds for supposing that it was then something of a novelty. We need not therefore expect that Augustine's church had anything of the sort.

The whole of the present cloister area has not as yet been thoroughly explored, but it may at any rate be said that the wall bounding it on the west appears to be older than anything else now above ground. At latest, it may be of Scotland's or Wido's time, but there is a possibility that it goes back to Dunstan. However this may be, the foundations of a wall running parallel to it a few feet to the east must be older than it, and if they may be taken in connexion with a third wall, 20 ft. again eastward, point to a substantial building on this site, to the north of the Saxon forecourt, with which it seems to stand in a definite relation.

Against the north side of Augustine's church, and extending between the enlargement of the archbishops' porticus and the foundations under notice, are the remains of a stone bench against which the original plastering of the wall appeared to stop.

The Abbey of SS. Peter, Paul, and Augustine, Canterbury. – c.1066.

Porticus

Bench

Tomb

Justus | Mellitus | Laurentius

Honorius | St. Gregory

Deusdedit | + Augustinus

Porticus

Britwaldus | Theodorus

Fore

Court

Tower

Steps up

Vestibule

Steps up

Second Narthex | First Narthex

Church of S.S. Peter and Paul

Steps Down

Crypt of Wulfric's Octagon

Church of St. Mary

Steps up

Porticus

St. Martin

Liuthardus

Bereta | Ethelbertus

Tomb

Late 6th & early 7th Cent. | Probably 10th Century | Uncertain | Mid 11th Century

FEET 10 5 0 10 20 30 40 50 60 70 80 FEET

Fig. 6. Suggested plan of the reconstructed church of Abbot Wulfric. Scale 16 ft. = 1 in.

DISCUSSION

Mr. JOHNSTON said the paper was a masterly exposition of the site, and contained facts new even to those who had followed Sir William Hope's work and had gone over the excavations. Of special interest was the correlation of the early conception of St. Austin's. For the first time a link had been provided between the earlier Saxon work and pre-existing Romano-British remains. There must either have been a continuous tradition of building or a revival at Canterbury, and he for one was grateful for such a lucid exposition of the problem.

Dr. FLOYER held that traces of the revival could be found in Dunstan's churches, and the Benedictine impulse led to church-building at Glastonbury, Canterbury, Thorney, and Abingdon. The style of architecture might have come from the same source as the revival itself, which was centred in the reformed monasteries of the Loire. He had much enjoyed the paper which had pointed out the connexion between Saxon architecture and the remains of Roman work.

Mr. E. W. LOVEGROVE said that many were under the impression that the octagonal plan came from Aachen rather than Dijon, but if from the latter, was it not possible that other details were derived from the same region? He inquired the origin of the cylindrical pier, which did not occur in the Norman style till long afterwards, but was seen in earlier work south of Dijon in Burgundy. The pilaster strip, which was common in eleventh-century Saxon work, might have travelled from Italy via Burgundy; and if that route were established, many questions would be cleared up, including those mentioned.

Rev. R. U. POTTS remarked that William of Volpiano, according to Sir Thomas Jackson's book, after reforming Dijon was requested by the ecclesiastical authorities to go to Normandy, and reluctantly consented to leave his own monastery. At Dijon Wulfric might have come under his influence.

The PRESIDENT accorded the Society's thanks to the authors, who had carried out a most important piece of research. A hint of future discoveries had been given, and he trusted they would confirm the views expressed in the paper, even if the missing tombs were not found.

IX. *The Carved Stones at Breedon on the Hill, Leicestershire, and their position in the history of English Art. By* A. W. CLAPHAM, *Esq., F.S.A.*

Read 24th March 1927

THE series of carved and sculptured stones built into the walls of the church of Breedon on the Hill, Leicestershire, has long attracted attention, not only by reason of the unusual excellence and delicacy of the carving but also from the remarkable forms that the carving itself assumes. The fact that, in spite of some timid opposition in the past, the theory that these carvings are the work of late twelfth-century craftsmen has hitherto held the field, is sufficient excuse for my bringing the subject before the Society, believing as I do that an entirely wrong date has been assigned. The alternative date—the latter part of the eighth century—which I shall put forward, will, if established, at once place the series in a foremost position in the history of English art, and supply an entirely new chapter in its development.

Together with the series at Breedon, I shall also consider the parallel, but much smaller, series at Fletton, Hunts,[1] with which it is so closely allied that if the date of one series be firmly fixed, the date of the other presents no particular difficulty.

Before proceeding to the consideration of the stones themselves, it will be well to set forth such facts in the history of the two places as bear directly on our subject. The church at Breedon is situated on the summit of a steep hill, of roughly oval form, some nine miles SSE. of Derby, and commands an extensive view over the vale of Trent. The comparatively flat summit of the hill is enclosed by an earthwork, much obliterated in parts, but remaining, on the east side, in such an abrupt and undenuded form as to render its attribution to prehistoric times very unlikely. It may on the other hand have formed the precinct either of the Saxon minster or of the later medieval convent.

For the early history of the site I am indebted to Professor F. M. Stenton of Reading, and I would add that the following account from his pen sets out for the first time the evidence for the existence of the Leicestershire monastery, most if not all of the references cited having hitherto been assigned to the Worcestershire monastery of the same name. Professor Stenton writes:

There can, I think, be no question that an eighth-century religious establishment existed at Breedon on the Hill, Leicestershire. The crucial evidence is that Bede (*Hist.*

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[1] *Royal Commission on Historical Monuments, Hunts,* p. 97 and pl. 58.

Eccl. v, 23) describes Archbishop Tatwine (731–4) as belonging to the province of the Mercians, 'since he had been a priest in the monastery called Briudun'. The only other place of this name, of which we know anything, is the Worcestershire Bredon, and Bede would certainly have described the latter as in the province, not of the Mercians, but of the Hwicce. Bede is very accurate in his use of geographical terms, and neither he nor any other early writer would have said that a place in the south of modern Worcestershire was in Mercia. I think that the identification with the Leicestershire Breedon is as safe as any other identification in the whole of Bede.

It is to my mind confirmed by the grant of the latter place to Bishop Ethelwold (of Winchester, 963–84) by King Edgar (*Cart. Sax.* 1283). We know that this bishop obtained from Edgar the sites and something of the property of other derelict monasteries. He obtained, for instance, Barrow on Humber, where Bishop Ceadda had founded a monastery in the seventh century. The grant of Breedon is, I think, an exact parallel to this.

I also have very little doubt that there is another reference to this early Mercian monastery in a grant (*Cart. Sax.* 454) of privileges to a religious house '*aet Breodune*'. This reference is not quite so certain as the two previous ones, for it is complicated by the existence of another similar grant (*Cart. Sax.* 434) which undoubtedly relates to the Worcestershire Bredon. But of the two documents I think that the former is more nearly original, and as it shows that the consent of the ealdorman of the Tonsaete (a provincial name probably derived from the river Tame) had to be obtained, it is clear that the charter refers to the Leicestershire place. It is a slight, but I think, a real confirmation of this view, that the charter was granted at Repton (seven miles west of Breedon). As the charter comes from a Peterborough Cartulary, it is clear that the 'Bredune' of the Peterborough Chronicle, under the year 675, refers to the same place, though this reference only forms part of a twelfth-century insertion in this record.

You need therefore have no hesitation in accepting the existence of a very early religious house at the Leicestershire Breedon. Whether that house was of seventh- or of eighth-century foundation one cannot say. I myself believe that it belongs to the group of seventh-century houses of which, if Hugh Candidus may be trusted, Brixworth was one. But this is only an opinion.

So far Professor Stenton. There can be little doubt that the early monastery at Breedon ceased to exist, as such, when the Danish army wintered at Repton in 874. Ethelwold, to whom the site came by grant of King Edgar, refounded several of the derelict monasteries which came into his hands, as for instance Peterborough and Ely, but Breedon was not amongst them. That the building survived in some form as a parish church is probable, but until the foundation there of a small priory of Austin Canons in the twelfth century, as a cell to Nostell in Yorkshire, little more is heard of it. Something was done to the building by the twelfth-century canons, and their work includes the lower part of the existing tower. The presbytery with its aisles was rebuilt in the thirteenth century, but this and the subsequent history of the building, which has been
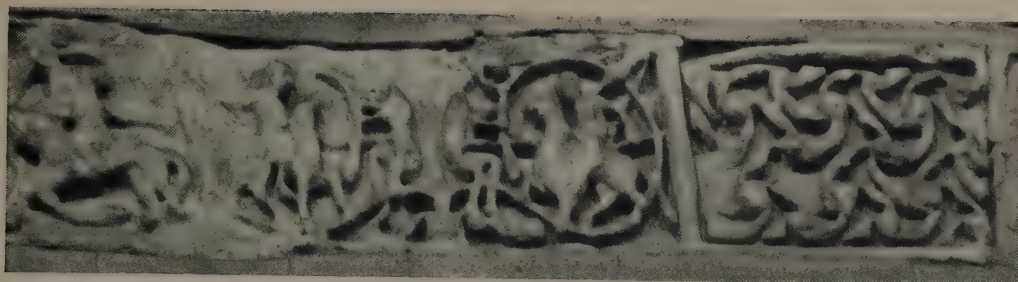
Fig. 1. Breedon.   Frieze (4) on N. wall of Chancel

Fig. 2. Breedon.   Friezes (25 and 26) on E. face of S. Porch

Fig. 3. Breedon.   Frieze (2) on N. wall of Chancel
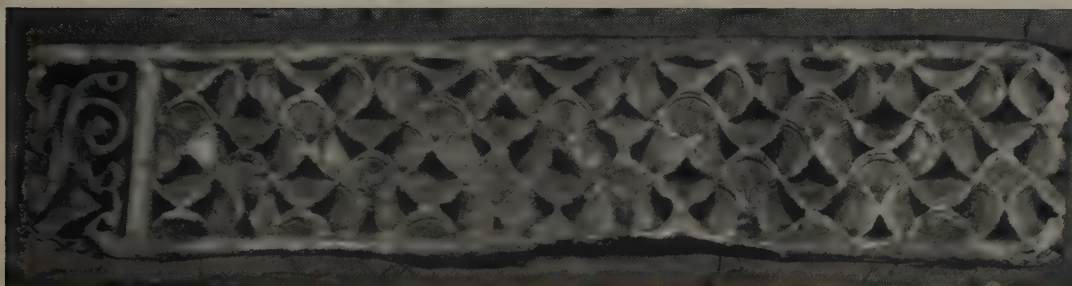
Fig. 4. Breedon.   Frieze (3) on N. wall of Chancel

Fig. 1. Breedon. Friezes (27, 28, and 29) on S. face of S. Porch

Fig. 2. Breedon. Frieze (1) on E. wall

Fig. 3. Breedon. Frieze (7) in N. wall of Chancel

Fig. 4. Breedon. Fragment of Frieze (18)
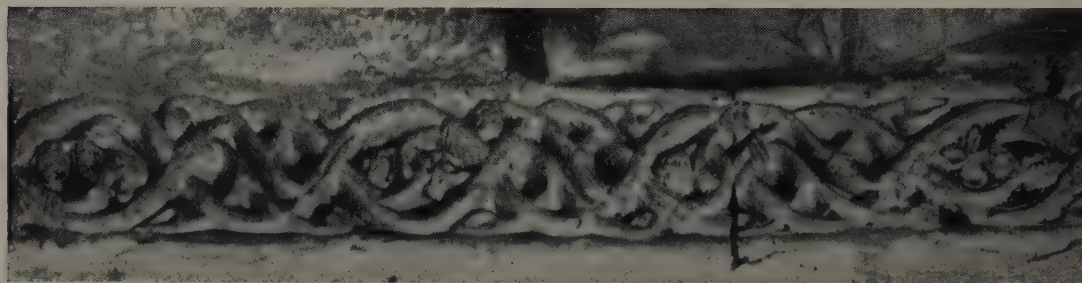
Fig. 5. Breedon. Frieze (18) in S. wall of Tower

Fig. 1. Breedon.   Frieze (5) on N. wall of Chancel

Fig. 2. Breedon.   Frieze (11) on S. wall of Chancel

Fig. 3. Breedon.   Frieze (10) on S. wall of Chancel

Fig. 1. Breedon. Panel (22) on external wall of S. aisle

Fig. 2. Breedon. Frieze (6) in N. wall of Chancel

Fig. 3. Breedon. Frieze (12) on S. wall of Chancel
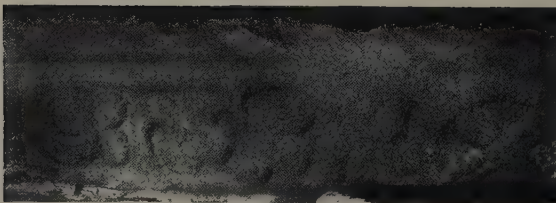
Fig. 4. Breedon. Fragment of Cross-shaft (30)

Fig. 5. Breedon. Panel (13) and fragment
(14) in S. wall of S. aisle

carefully studied by our Fellow Mr. Chatwin, need not detain us. It only remains to add that the church is dedicated to the Virgin and St. Hardulph, a saint of whom nothing definite is known.

It will be seen from the above that the historical facts indicate two pre-Gothic periods only when elaborate decoration is likely to have been done in the church: the first from the eighth to the ninth century, and the second late in the twelfth century.

Fig. 1. Breedon, chancel looking north-east, showing friezes in spandrels of arcade.

To turn now to Fletton. It is a village only about a mile, as the crow flies, to the south of Peterborough. The earliest work in the church is of mid twelfth-century date, but there can be little doubt that the carved stones there are either directly derived from the abbey of Peterborough, or are at any rate the product of the abbey masons. The history of the abbey of Peterborough is, with the exception of the gap from 870 to 972, continuous from the foundation in 655 to the dissolution, so that no argument for the date of the stones can be based on the history.

It should perhaps be noted here that all the places we shall have to deal with —Breedon, Fletton, and Castor—were at one time or another within the Peterborough orbit, which also included the Minster of Brixworth.

As to the stones themselves, the series at Breedon consists of no less than thirty separate items, built into all parts of the existing structure (fig. 1), By far the greater number are sections of carved friezes of two widths, the larger about 9 in., and the smaller 2 in. less, the two together measuring more

than 80 ft. of running length. This accounts for the first twenty items. The rest are of more miscellaneous character and consist of a fragment with a curved moulding and carving, a panel with a lion, fragments of two cross-shafts, an upright panel with two figures, two sculptured slabs with large figures under arches, and finally three stones of an entirely different character with a series of figures under arches.

The following is a schedule of the individual stones:

Inside the building. Chancel, on east wall:

1. Narrow frieze (7 in. wide) running the full width of the chancel (18 ft.) and consisting of a conventionalized vine-scroll with single and trefoiled leaves of hollow-cut type (pl. XXXII, fig. 2).

On north wall:

2. Broad frieze (9 in. wide); section with mounted man in scroll with interlace-panel on the same stone, set in east spandrel of arcade (pl. XXXI, fig. 3).

3. Broad frieze; section with panel of pelta-ornament and vine-stem with hollow-cut leaves on the same stone; set over first column of arcade (pl. XXXI, fig. 4).

4. Broad frieze; section with panels of trumpet-spirals and mounted men in scrolls, as in (2), on same stone; set over second column of arcade (pl. XXXI, fig. 1).

5. Broad frieze; section with bird, beasts, and man in scroll; set over third column of arcade (pl. XXXIII, fig. 1).

6. Broad frieze; section with two falcons or eagles with spread wings; set in west spandrel of arcade (pl. XXXIV, fig. 2).

7. Broad frieze; section with panels of diagonal fret-pattern and a bird pecking grapes; set under west gallery (pl. XXXII, fig. 3).

On south wall:

8. Broad frieze; section with ivy-vine scroll, birds, and man; set in east spandrel of arcade.

9. Broad frieze; section with ivy-vine scroll, having hollow-cut leaves, birds and beasts; set over first column of arcade.

10. Broad frieze; section with vine-plants forming cartouches, hollow-cut leaves and heavy type of beasts; set over second column of arcade (pl. XXXIII, fig. 3).

11. Broad frieze; section with vine-scroll having hollow-cut leaves and various monsters; set over third column of arcade (pl. XXXIII, fig. 2).

12. Broad frieze; section with man and bird in scroll; set in west spandrel of arcade (pl. XXXIV, fig. 3).

In south aisle; in south wall, near east end:

13. Upright panel (19¼ in. by 10 in.), with two figures of men holding

hollow-cut leaf stems; panel complete on left, but mouldings continued on right for an adjoining panel (pl. xxxiv, fig. 5).

14. Fragment (whole stone 21½ in. high), with part of curved projecting moulding on face, and within it part of carved beast; set immediately over no. 13 (pl. xxxiv, fig. 5).

15. Cross-shaft, section (16 in. long by 12½ in. at base and 11½ in. at top), with moulded angles, three faces with carved beasts and one with interlace; formerly in wall, now taken out (pl. xxxv).

In tower; in north wall of ground stage:

16. Broad frieze; section of design of birds and foliage, much defaced.

17. Broad frieze; section with elaborate interlace, much defaced.

In south wall of ground stage:

18. Narrow frieze; section with ivy-vine scroll (pl. xxxii, fig. 5). Another fragment of this frieze was found in the autumn of 1927 under the floor of the chancel (pl. xxxii, fig. 4).

In south wall of second stage:

19. Panel (36 in. by 20½ in.), with full-length figure of angel under round arch with side shafts (pl. xxxvii, fig. 2).

Outside the building. On east wall:

20. Panel (about 21 in. by 18 in.), half-length figure of man blessing, under round arch with side shafts (pl. xxxvii, fig. 1)

21. Panel with three figures under an arcade; of different type and on different stone from the other carvings (pl. xxxix, fig. 1).

On south wall of south aisle:

22. Panel with lion holding leaf-stem (pl. xxxiv, fig. 1).

On south porch; on east face:

23. Panel as no. 21 with three figures (pl. xxxix, fig. 2).

24. Panel as no. 21 but with two figures only (pl. xxxix, fig. 2).

25. Broad frieze; section with diagonal fret-pattern (pl. xxxi, fig. 2).

26. Broad frieze; section with panels of elaborate interlace and beasts, on same stone, beasts much defaced; double 13th-century head-corbel cut on butt-end of stone and destroying part of interlace-panel (pl. xxxi, fig. 2).

On south face:

27. Broad frieze; section with cocks and falcons with foliage stems, two heads cut on butt-end of stone (pl. xxxii, fig. 1).

28. Broad frieze; section with panels of diagonal fret-pattern and beasts with foliage stems (hollow-cut leaves), on same stone (pl. xxxii, fig. 1).

29. Broad frieze; section with men picking grapes (pl. xxxii, fig. 1).

30. Section of cross-shaft, forming lintel of doorway in south-west turret-

staircase. My attention has been recently called to this item by Mr. J. S. Routh (pl. xxxiv, fig. 4).

The whole of this series of carved stones would appear, both from the character of the work and from the execution of some of the details, to be of approximately one date, with the exception, possibly, of the two large figure-sculptures and certainly of the cross-shafts and the three stones (21, 23, and 24) with figures under a continuous arcade. The large figure-sculptures need not differ in date, but they are sculpture rather than carving, and in consequence are by a different hand. The photographs of some of the friezes might lead one to suppose that here there were two types of work, one much heavier than the other; but this effect is partly due to the fact that many of the stones are heavily clogged with whitewash, from which others are entirely free.

The carved stones at Fletton consist of six sections of carved frieze, built into the external walls of the chancel and two full-length figures in round-arched panels, built into the interior of the chancel.

The following is a schedule of the individual stones:

On the north-east buttress of the chancel:

1. Frieze (7 in. wide); section consisting of a panel of pelta ornament with a half-figure of an angel at one end (pl. xl, fig. 2).

On the south-east buttress of the chancel:

2. Frieze; section with a series of men and beasts standing between inter-laced trees or stems (pl. xl, fig. 3).

3. Frieze; section similar to no. 1 but with bust at the opposite end (pl. xl, fig. 4).

4. Frieze; section in two panels, one with a bird and foliage, and one with birds and beasts in an interlacing design, much weathered (pl. xl, fig. 3).

5. Frieze; section with three busts of men, each with a nimbus, and each set under a round arch (pl. xl, fig. 3).

6. Frieze; panel with free vine-stem with hollow-cut leaves (pl. xl, fig. 4).

On the internal south wall of the chancel:

7. Stone with full-length figure of angel set in a round-headed panel, with remains of inscription (pl. xl, fig. 1).

8. Stone with full-length figure of man in similar panel (pl. xl, fig. 1).

It is obvious that in an inquiry of this nature no finality can be attained except by the production of absolute evidence based upon datable examples of ornament or other features drawn from elsewhere; and conversely that any argument based upon my own or another's views on the character and style of the work will leave the inquiry in precisely the same position as it was before the subject was re-opened. I shall therefore endeavour to confine myself to the first of these lines of argument, and only intrude upon the second in such cases

as may fairly be held to be uncontroversial. I shall furthermore restrict myself as far as possible to the production of English analogies whenever the matter of date is concerned, and only cite foreign examples in illustration of the origin of a form or its subsequent development.

It must always be remembered that early forms of ornament survived far into the middle ages in Ireland, in the remote parts of Scotland, and to a less extent in Wales, and any argument based upon analogies from these sources is not only useless but dangerous when applied to work in the heart of England.

It will be found that I shall return again and again to the manuscripts; for this I make no apology, for they form the best dated and indeed almost the only incontrovertible authority that we possess. In the matter of style, the manuscript is of very doubtful value as evidence when dealing with stone-carving, but on the definite point of a decorative detail, or still more of a ceremonial usage, there can, I think, be no doubt of its capital importance.

I propose to deal with the various decorative motives individually, beginning with the purely geometric forms, passing on to the vine-scrolls, plants, animal and human forms, and concluding with the figure-sculpture proper.

The purely geometrical forms consist of the trumpet-spiral, the diagonal fret, the pelta ornament, and the interlace.

The *Trumpet-spiral* (Breedon 4; pl. xxxi, fig. 1) is so well-known a motive that I need not enter into its origin or antecedents. Its essential feature is the trumpet-shaped extension of the connecting limb between the spirals. It appears as a staple ornament in almost all the English eighth-century manuscripts, such as the book of Lindisfarne, and the Codex Aureus of Stockholm and many others (pl. xxxviii). The first of these is safely placed, for any but the hypercritical, in the beginning of the eighth century. In stone this motive in England is so far confined to the present example and the single stone at South Kyme, Lincolnshire.[1] The motive maintained its place in Irish and Scottish stone-carving, at least till the tenth and perhaps to the eleventh century, but in England it had disappeared from the manuscripts by the tenth century, and any spirals which survive to that age have lost their trumpet form. The trumpet-spiral is entirely unknown in the post-Conquest art of this country in the eleventh and twelfth centuries. The spirals at Breedon are not of the pure form of those at South Kyme, and are so far more distant from their originals, but the stone is clogged with whitewash and the details are not very apparent; the trumpet form is, however, definitely retained. What is perhaps a still further degradation of the form is to be found on the slab, probably a door-jamb, from

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[1] *Antiquaries Journal*, iii, p. 118.

the parish church at Bradford-on-Avon.[1] Here, however, the trumpet form has disappeared and the whole design has become a meaningless diaper. There is no doubt that this slab is pre-Conquest, but its date is indeterminate.

The conclusion then from this evidence is that the frieze at Breedon must date from before the Danish destruction in 874, and the trumpet-spirals carry with them inevitably the mounted men with spears which are carved on the same stone.

The *Diagonal Fret* (Breedon 7, 25, and 28; pl. XXXII, figs. 1 and 3) is another of the staple motives of the eighth-century English manuscripts; it forms the groundwork of a whole page of the Lindisfarne book.[2] In Anglian stone-carving it occurs on the cross-shaft at Abercorn,[3] which historically should date from the short episode of the Anglian See of Abercorn (681–5); on two cross-shafts at Lindisfarne[4] which was finally abandoned in 875; on a fragment at Northallerton,[5] assigned by Collingwood to the early period; on a cross-base from Hurworth, Durham,[6] of about the same period and in various other places. Debased forms of the same motive occur in isolated instances on stones assigned by Collingwood and others to the Viking period, but in none of these is the form used as a continuous diaper.[7] In Wales it maintained its place, in the same debased form, till a comparatively late period and was copied in occasional instances in the English Marches in the twelfth century.[8] In its purer form the fret survives to a later period in both Ireland and Scotland. Except for such examples as those noted above it is absent from English post-Conquest art of the eleventh and twelfth centuries, the only form at all approaching it being the Greek key-pattern, in its classical form, used as a border; even this is very uncommon in England. The diagonal frets at Breedon are of the well-formed early pattern of the examples cited above.

The conclusion, then, from this evidence is that frets of the type used at Breedon should date from before the Danish destruction in 874, and the frets

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[1] This stone is now preserved in the Saxon Chapel, but was found on the site of the parish church; it no doubt formed the jamb or reveal of a doorway. See *Brit. Arch. Assoc. Journ.*, xxxiii, 215.

[2] E. Millar, *The Lindisfarne Gospels*, pl. xxx.

[3] Romilly Allen, *Early Christian Monuments of Scotland*, 418, and G. F. Browne, *Theodore and Wilfrith*, p. 255.

[4] *Archaeologia*, lxxiv, pl. LIII.

[5] W. G. Collingwood, 'Anglian and Anglo-Danish Sculpture in the North Riding' in *Yorkshire Arch. Journ.*, xix, p. 372 with fig.

[6] Haverfield and Greenwell, *Catalogue of the Sculptured and Inscribed Stones in the Cathedral Library at Durham*, p. 96.

[7] e. g. at Gosforth (Cumberland). A late survival in the manuscripts is to be found in the tenth century Aldhelm's 'De Virginitate' at Lambeth (Westwood, *Miniatures and Ornaments of Anglo-Saxon and Irish Manuscripts*, pl. 31).

[8] e. g. the fonts at Edgmond and Lilleshall, Shropshire, see Cranage, *Churches of Shropshire*, ii.

c

a

b

Breedon.   Fragment of Cross-shaft (15)

Fig. 1. S. Agnese f. le Mura Rome.　Marble panel
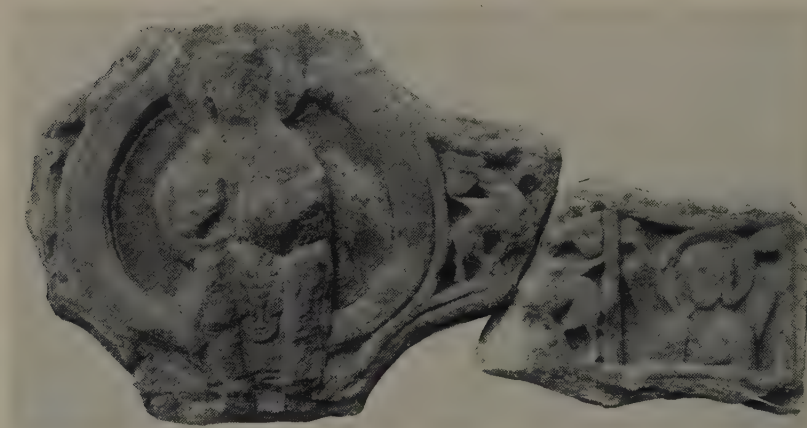
Fig. 2. Hoddom.　Cross-head
By permission of the Controller of H.M. Stationery Office and the Royal Commission on Historical Monuments, Scotland
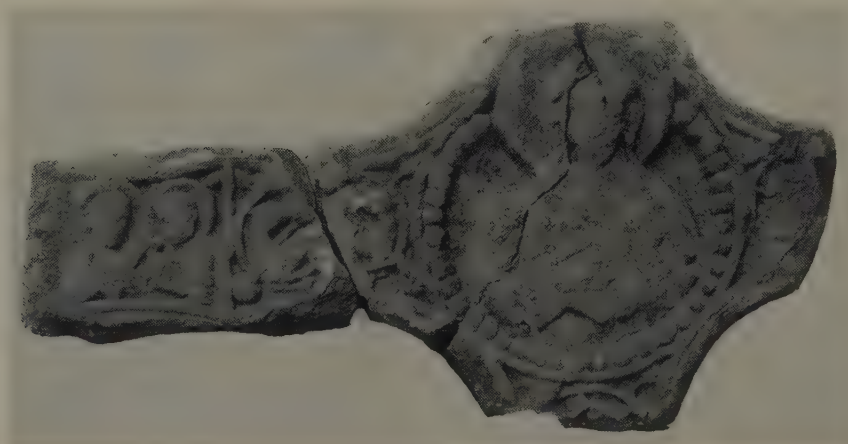
Fig. 3. Hoddom.　Cross-head
By permission of the Controller of H.M. Stationery Office and the Royal Commission on Historical Monuments, Scotland

carry with them the Anglian beasts and the bird pecking grapes which are carved on the same stones.

The *Pelta Ornament* (Breedon 3 ; pl. xxxi, fig. 4, and Fletton 1 and 3 ; pl. xl, figs. 2 and 4) is the most unusual of the motives employed at either place and in consequence deserves a fuller consideration of its origin and distribution. The design consists essentially of pairs of half-circles set back to back in such a way that the combination forms a series of figures like a double-headed axe or an Amazon-shield. It has been suggested that the origin of the form is to be found in the peltae or Amazon-shields, which are not uncommonly found in Roman mosaics and of which there are numerous examples in Britain at Lydney Park, Horkstow, and elsewhere.[1] The probability of this connexion can I think be established, for the sequence, though attenuated, is unbroken ; thus the same form occurs on a mosaic, assigned to the Merovingian period, found under the parvis of Notre Dame at Paris,[2] in the late fourth- or early fifth-century marble slab at Santa Agnese, Rome (pl. xxxvi, fig. 1),[3] in an early fifth-century mosaic near the Baptistry at Salona,[4] on a fragment from the Merovingian cathedral at Nantes and elsewhere. From Carolingian times[5] onwards the pelta becomes a fairly common ornament in continental manuscripts, paintings, plaster-work, and stone-carving. In the twelfth century it had a considerable vogue in France and Italy, and took its place side by side with the familiar scale-pattern. It appears in the cathedrals of Chartres, Le Mans, Bourges, Piacenza, Modena, Cremona, and Ferrara[6] and in numerous other churches.

In view of this continuous use on the continent, it is the more remarkable that, with the exception of the carvings under review, the pelta does not, so far as I am aware, occur in any form or at any date in English stone-carving. There is, however, a manuscript example in the eighth-century South English Codex Aureus of Stockholm, where it decorates the archivolt of an architectural setting for the figure of St. John (pl. xxxviii, fig. 1).[7]

[1] For the three pavements at Lydney Park see W. H. Bathurst, *Roman Antiquities at Lydney Park, Gloucestershire*, pls. v, xiv, and xvii. Other British mosaics with the same motive occur at Horkstow (Lincs.), Frampton (Dorset), Withington (Gloucestershire), all figured in Lysons, *Reliquiae Britannico-Romanae*, at Scampton (Lincs.) and elsewhere.

[2] Reproduced in Bordier and Charton, *Histoire de France*, i, p. 134.

[3] Reproduced in C. Cecchelli, *S. Agnese f. le Mura*.

[4] See *Forschungen in Salona*, Vienna, 1917, i, p. 78 ; a mosaic of similar character has been found in a fifth-century church at Hemmaberg, see *Deutsches Arch. Institut, Romanisch-Germanische Kommission*, xv (1923–4), p. 236.

[5] See Paul Deschamps, 'Un Motif de Décoration Carolingienne et ses transformations à l'époque Romane' in *Bull. Mon.* (1921), p. 255 and (1925), p. 95 ; Stückelberg in *Revue Charlemagne* (1911), No. 2, pp. 90–2, and *Mem. de la Soc. nat. des Antiq. de France*, ser. 8, ii (1912), p. 241.

[6] Italian examples are reproduced in C. Martin, *L'Art Roman en Italie*, i, pls. 31 (Piacenza), 46 (Modena), 71 (Ferrara).

[7] See E. H. Zimmermann, *Vorkarolingische Miniaturen*, pl. 283.

The conclusion from this evidence is that the friezes may be of the eighth century, the only other available English example being of that date; the evidence, however, is so slender that if it stood alone, in view of the continuous use of the pelta on the continent, it could not be pressed. The pelta-friezes, however, carry with them the half-figures of angels at Fletton and the vine-stem at Breedon, both of which provide a confirmation of the date suggested by the Codex Aureus. It should be borne in mind that the presence of the motive at Breedon and Fletton alone is significant, and any theory of twelfth-century origin must explain its entire absence from the vast mass of twelfth-century ornament which survives in this country.

The *Interlace* (Breedon 2, 17, and 26; pl. xxxi, figs. 2 and 3), unless its characterization be very marked, is no safe criterion of date. It is present in the earliest Anglian Christian art and survives till the dawn of the Gothic period. Between the twelfth-century variety, however, and that of the seventh and eighth centuries, there are certain well-marked differences. The chief of these is that the later variety is commonly, though not always, of three strands, or of two strands divided by a row of pellets. This form is, I think, never present in the early work of this country. The interlaces of the early manuscripts are all, or nearly all, of the single strand variety, as are those on the Brunswick casket, a work assigned to the eighth century and made at Ely. The interlaces at Breedon are all of this single strand variety, and have none of the clumsy coarseness of the later work; they remind one rather of ivory cutting than of stone-carving. In design the interlace on the south porch is exactly paralleled by a stone now built into a buttress of Ripon minster.[1] This stone is regarded by Collingwood as late in the pre-Danish period. One panel of interlace on the Bewcastle cross[2] is very close indeed to our example, and several interlaces on the Book of Lindisfarne only differ by the duplication of the strands and the consequently greater complexity of the design.

The conclusion from this evidence then is that the interlaces are of the early pre-Danish type, and cannot be paralleled in twelfth-century work. The interlace-friezes carry with them the mounted spearmen in scrolls and the Anglian beasts carved on the same stones.

The *Vine Plant* and *Scroll* (Breedon 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 16, 18, 26, 27, 28, and 29; pls. xxxi, fig. 1, xxxii, xxxiii, xxxiv, fig. 4; Fletton 6; pl. xl, fig. 4). The evolution of the vine-scroll from its eastern original to its final degeneration

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[1] Reproduced in G. Forrest Browne, *Theodore and Wilfrith*, p. 112, and W. G. Collingwood 'Anglian and Anglo-Danish Sculpture in the W. Riding' in *Yorks. Arch. Journ.* Precisely the same design but with a double strand is to be seen on the superb Peacock slab from S. Salvatore Brescia, dated 753 by Cattaneo.

[2] See Baldwin Brown, *The Ruthwell and Bewcastle Crosses*, pl. xii.

and disappearance has been so thoroughly dealt with in the remarkable work of Professor Brøndsted on Early English Ornament,[1] that it will be superfluous here to recapitulate his theory. Suffice it to say that generally speaking the closer the copy is to nature, the nearer it should be to the original introduction in the seventh century. This is broadly the basis upon which Professor Brøndsted's sequence is worked out and is also at the back of Mr. Collingwood's classification. It may be added that according to both of these authorities little recognizable vine-scroll survived the ninth century.

The vine plant as represented at Breedon and Fletton is entirely of the ivy or lotus-leaf type and in the great majority of cases the leaves are hollow-cut, forming a cup-like sinking. This peculiarity is very noticeable, and indeed forms one of the most distinguishing features of the series. The rendering of the plant itself takes two distinct forms, one the more ordinary scroll and one the isolated plant, complete in itself and sometimes reduced to a single stem. The hollow-cut leaf is, however, common to both forms, and appears both at Fletton and Breedon.

The narrow friezes at Breedon are ornamented with the simple vine-scroll without figures and first demand attention. The best preserved of these is the frieze on the east wall, which is a very perfect piece of work. The hollow-cut flowers and the conventional binding of the branch-junctions should be particularly noticed. Set side by side with one of the Ilkley[2] crosses (fig. 2) it will be at once seen that the design and the rendering thereof are practically identical, allowance being made for the fact that the Ilkley cross has long been exposed to the weather, and consequently the sharpness of the carving has been lost. Now the Ilkley cross-shaft is not an isolated example; it takes its place in a regular sequence of very similar Northumbrian crosses,[3] and that place according to Professor Brøndsted is late in the eighth or early in the ninth century, and according to Mr. Collingwood in the middle of the ninth century.[4] Any attempt, therefore, to place the Breedon frieze in the twelfth century must necessarily bring the whole structure of pre-Conquest dating, laboriously raised by a generation of antiquaries, tumbling to the ground; for if the Breedon frieze be twelfth century the same date must inevitably be assigned to the Ilkley cross, and to its immediate forbears and successors, with a resultant chaos in our chronological scheme which it is painful to contemplate.

[1] J. Brøndsted, *Early English Ornament*, English translation, 1924.
[2] Reproduced in Brøndsted, *op. cit.*, fig. 59, p. 68 (photograph), and Collingwood, *Yorks. Arch. Journ.* (drawing).
[3] Compare the cross-shafts of Stamfordham (narrow face), the Spital Cross at Hexham (narrow face), Simonsburn (narrow face), all figured in *Arch. Aeliana*, 4th ser., i ; Eyam, figured in Brøndsted, *op. cit.*, fig. 58, p. 67 ; Bradbourne, figured in *Arch. Journ.*, xlv, p. 8 ; Wycliffe, figured in *Yorks. Arch. Journ.*, xix, p. 412, &c.
[4] *Arch. Aeliana*, 4th Ser. i, p. 83.

It is not my intention to consider separately all the other examples of the vine-scroll or plant at Breedon and Fletton. I will only call attention to the curious use of the form in several friezes, such as the grape-picking, cock and falcon, and Anglian beast frieze, where the plant forms a very thin undergrowth
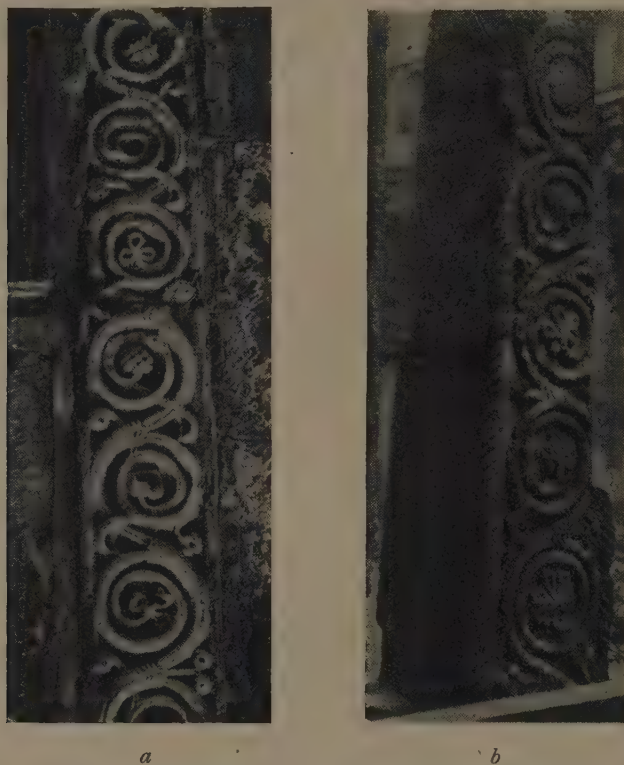
a *b*
Fig. 2. (*a*) Breedon frieze and (*b*) Ilkley cross-shaft.

with a series of individual stems. This feature is, I think, almost if not quite confined to the Breedon series.

The conclusion from this evidence is then all in favour of a pre-Danish date for the carvings.

My remarks on the various forms of animal life represented in the friezes must be limited to a few of the most noticeable examples. Among the birds the most striking is the series of cocks and falcons, already referred to. The breast or other feathers of all the birds in this frieze are rendered by a series of drilled holes, appearing to the eye as small round spots. This form of representation might be referred to a textile original, of the type that exists among the tissues of the Sancta Sanctorum at Rome,[1] but I think it more probable that it is simply

[1] *Mon. Piot*, xv, reproduced in G. Diehl, *Manuel d'Art Byzantin*, i, p. 269, and H. Glück, *Christliche Kunst des Ostens*.

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Fig. 2. Breedon.   Panel (19) in S. wall of second stage of tower

Fig. 1. Breedon.   Panel (20) on external E. wall

Fig. 2. Codex Aureus of Stockholm. Fol. 11a

Fig. 1. Codex Aureus of Stockholm. St. John

a copy from the manuscripts. There is an excellent cock with a spotted breast in the eighth-century Trier Gospels[1] from Echternach in Luxembourg, and an eagle similarly spotted in the early eighth-century book of St. Chad[2] at Lichfield.

Cocks, except in connexion with the denial of St. Peter, are not a particularly common feature in Christian art. In Anglian stone-carving they appear in a feeble form at Brompton (Yorks.), assigned by Collingwood[3] to the pre-Danish period, and on the tower at Barnack,[4] where the conjunction of the acanthus leaf shows that the carving belongs to the tenth century or later.

The peacock, for such I take to be the species of the birds in two of the Breedon friezes, is of course a commonplace in early Christian art, and maintained its position in Italy, at any rate, to the twelfth or thirteenth century. Its very uncommon occurrence in England is then the more surprising. It occurs in a single instance in the book of Kells, and on the ring of King Ethelwulf in the British Museum. The most significant occurrence, however, is on a chasuble traditionally belonging to St. Aldhelm (d. 710), which William of Malmesbury[5] saw and described as being ornamented with black scrolls containing peacocks. The only other English example in stone that I have come across is on a tomb-slab at Bishopstone[6] in Sussex, which I take to be a pure copy from an Italian model, perhaps earlier than the tenth century, though I hesitate to suggest a date for the copy.

The Anglian beasts on two of the porch friezes at Breedon are very closely paralleled by a whole series of beasts from the Northumbrian cross-shafts. Such for instance is the beast found by Mr. Peers at Whitby, and such are the two beasts on the cross at Hoddom (pl. xxxvi, figs. 2 and 3). This cross[7] is also of importance as providing the closest parallel to the half-figures of angels at Fletton. The rendering is much the same in the two cases, and both figures bear the same little rod with a tri-lobed end. Hoddom in central Dumfries-shire provides valuable evidence as to date. Politically Dumfries-shire formed part of the Northumbrian kingdom only until the defeat of Nectansmere in 685. After this date Northumbrian influence was intermittent for an uncertain period, but had completely ceased by about 800. The erection of a purely Anglian cross, such as that at Hoddom, must therefore be confined to this period to accord with any historical probability, and so we are again brought back to the eighth century as a probable date for our sculptures.

[1] Zimmermann, *op. cit.*, pl. 270.   [2] *Ibid.*, pl. 245.

[3] *Yorkshire Arch. Journ.*, xix, p. 300, with fig.

[4] Reproduced in Baldwin Brown, *Anglo-Saxon Architecture* (2nd ed.), fig. 115, p. 275.

[5] William of Malmesbury, *Gesta Pontificum* (Rolls Ser.), p. 365.

[6] Reproduced in the *Antiquary*, N.S., vii (1911), p. 374.

[7] *Royal Comm. on Hist. Mons. (Scotland) Dumfries-shire*, p. 101.

I need say little about the mounted men with spears: they go with the trumpet-spirals and the interlace, and in any case are a common enough motive at any period, though it would be difficult, if not impossible, to find in twelfth-century English art a series of nameless mounted spearmen used as a repeating decorative design. The centaur on frieze 11 (pl. xxxiii, fig. 2) is an unusual figure for the period, but one occurs in the early ninth-century Gospels of Lothaire (Paris).[1]

The evidence provided by the animal and human forms at Breedon and Fletton is not then so conclusive as that provided by the geometrical designs or the vine-scroll. On the other hand I think I have shown that there is nothing at either place inconsistent with an eighth-century date, and a great deal pointing in that direction. I would further point out the impersonal and purely decorative character of nearly all the figures. We are entirely in the decorative and not in the rhetorical stage of art. It is very difficult to conceive a twelfth-century carver in this country cutting 80 ft. or more of frieze without introducing a single biblical or legendary figure, and without once attempting either to instruct or to appal. Even the angels are purely lay figures—they neither announce nor condemn. We are in fact in a stage of development which decorated for pure delight in decoration, which with endless labour covered page after page with a thousand decorative fancies, birds and beasts, and intricate designs. This stage varied in date with its geographical position, but in this country it was largely past by the tenth century.

A few points must be stressed as to the general character of these carvings before passing on to the figure-sculpture. There is throughout the two series an entire absence of acanthus foliage. In isolated examples of tenth and eleventh-century carvings this would not carry much weight, but its absence from 80 ft. of decoration seems to me to be fatal to an attribution to that period, and a fortiori to the twelfth century, when it becomes the staple motive of foliage-decoration in stone. Furthermore, throughout the work there is not a trace of anything remotely resembling a post-Conquest moulding. The only moulding employed is a simple bead dividing the panels, and all the carving is cut from the flat surface. This brings me to my third point—the decoration of twelfth-century architecture by flat bands or friezes of carving is very uncommon in this country; the only important instance I can recall being the scriptural scenes on the west front of Lincoln Cathedral. In pre-Conquest work, on the other hand, a few examples of this form of decoration have survived, such as the friezes at Monkwearmouth and at Hovingham,[2] and something of the sort is perhaps implied by Prior Richard's description of Wilfrid's church at Hexham.

[1] A. Boinet, *La Miniature Carolingienne*, pl. xxxiv.
[2] Reproduced in Brøndsted, *op. cit.*, p. 37.

The Breedon collection includes two fragments of cross-shafts, one formerly built into the wall of the south aisle and one forming a lintel in a turret-staircase. The former (pl. xxxv) has recently (Autumn 1927) been taken out of the wall, and all four sides are now visible. Three sides are carved with single beasts, of which that on side (*a*) is the most remarkable; it is obviously a version of what Professor Brøndsted calls the South English or Merovingian beast rendered with considerable vigour and ability. The crescent-shaped spots are a remarkable feature. The beast on side (*b*) bears a very close resemblance to the confronted beasts on the cross-shaft in Gloucester Museum. The third side bears a much-weathered beast of similar character, and the fourth (*c*) is filled with coarse interlace. The Gloucester shaft [1] is dated by Brøndsted at the end of the ninth century, but it bears evident traces of Scandinavian influence which are absent from the Breedon example, which may thus be placed a generation or so earlier.

The second cross-shaft is much weathered, but has on one face a series of trefoil-leaves (pl. xxxiv, fig. 4).

The figure-sculpture proper at Breedon consists of two slabs with figures under arches (pl. xxxvii, figs. 1 and 2) and a smaller panel with two standing figures (pl. xxxiv, fig. 5). All three are by different hands, but the two figures in the last-named panel hold long plant stems terminating in hollow-cut leaves of the same generic type as the foliage in the frieze-panels. The figures are rendered with considerable freedom and facility, the drapery having the light and pliable characteristics which we are accustomed to connect with the Winchester school of the tenth century. On the strength of the leaf stems, however, I am inclined to equate this panel with the friezes in point of date.

The panel in the tower with a figure of an angel under a round arch is of bolder, if coarser, design and execution (pl. xxxvii, fig. 2). It possesses, however, a vigour which is absent from the panel just described. The figure holds the same short rod with a trefoiled end which we have already seen in the angels of the Fletton frieze, but the most remarkable feature is the action of blessing which is given in the Greek manner, that is to say, with the first, second, and little fingers raised, and not in the Latin manner with the thumb and two first fingers. The same action is shown also in the third figure of the series and deserves careful attention as bearing capitally on the date of the sculptures.

In early Christian times the use of the two forms apparently existed side by side. The point at which the Eastern church parted company from the Western in this particular ceremonial detail cannot be precisely ascertained, but there are indications that it had definitely taken place by the eleventh century. The general question, however, need not detain us, as it concerns rather the

[1] Brøndsted, *op. cit.*, pp. 141 and 218.

practice of Italy where the two churches touched, than the more western lands. In England a long and fairly extensive search among the available material has revealed no instance of the Greek blessing in post-Conquest times, or in the tenth to eleventh centuries. For the later of these periods the evidence is abundant, including manuscripts, seals, carved tympana and paintings; for the earlier period the manuscript material is also fairly abundant, and of the ten or twelve examples of the act of blessing in Ethelwold's Benedictional, all are in the Latin manner. Three English sources, however, do show the Greek blessing, and so far as I am aware three only, and all three of these belong to the latter part of the eighth century. The first of these is the Codex Aureus of Stockholm (pl. xxxviii, fig. 1),[1] redeemed from the pagan army, and given by the Ealdorman Alfred to Christ Church (Canterbury)—this manuscript has more than one example, of which the figure of St. John is here reproduced (pl. xxxviii, fig. 1); the second is the Maaseyck Gospels,[2] an English manuscript of the same period; and the third is the Tassilo chalice,[3] definitely dated by its inscription to the close of the eighth century, and classed on stylistic grounds by Brøndsted as south English work.[4]

In the absence of further evidence the conclusion is, I think, inevitable that the use of the Greek form of blessing in this country, if not confined to pre-Danish times, was at any rate less accidental then than at any later period; the examples cited point more particularly to its use in the second half of the eighth century.

[1] Zimmermann, *op. cit.*, pl. 283, &c. The author assigns the Stockholm codex to the third quarter of the eighth century. The historical particulars given above are inscribed on the MS. itself; the will of the donor has also survived, proving that he was a contemporary of King Alfred and Archbishop Ethelred. The *absolute* evidence thus proves that the MS. is at least as old as the middle of the ninth century, and perhaps much older. See Birch, *Cart. Saxon.*, nos. 554 and 634.

[2] *Ibid.*, pl. 319. Assigned by Zimmermann to South England and to *circa* 770.

[3] Reproduced in Brøndsted, *Early English Ornament*, p. 151.

[4] The Greek blessing also appears in late eighth and ninth-century Carolingian MSS., sometimes in conjunction with the Latin form, e. g. Trier Gospels, *c.* 775 (Zimmermann, *op. cit.*, pls. 272, 273, and 275); Godescalc Gospels, 781–3 (A. Boinet, *La Miniature Carolingienne*, pls. 3 and 4); Lorsch Gospels, first quarter, ninth century (*ibid.*, pl. 16); Gospels of Prum, mid ninth century (*ibid.*, pl. 36); Bible of Moutier Grandval, mid ninth century (*ibid.*, pl. 44), &c. After the end of the ninth century the Greek form seems to have been abandoned in France (see numerous examples of the tenth, eleventh, and twelfth centuries, all showing the Latin form, in P. Lauer, *Les Enluminures Romanes des Manuscrits de la Bibliothèque Nationale*, 1927, the publications of the *Soc. Française de Manuscrits à peintures*, &c.), but survived somewhat longer in Germany, e. g. the early tenth-century Gospels in the Stadtarchiv, Cologne (H. Ehl, *Die Ottonische Kölner Buchmalerei*, pl. 10); the Gospel-book of Archbishop Gero of Cologne (969–76), copied from the Lorsch Gospels (A. Schmidt, *Die Miniaturen des Gerokodex*, pl. 9); and two Ratisbon MSS. of the beginning of the eleventh century, the Sacramentary of Henry II and the Pericopenbuch (G. Swarzenski, *Die Regensburger Buchmalerei*, pls. 8 and 25). These last are the latest examples I have found north of the Alps, and the use of the form in Germany may have been influenced by the close connexion with Italy under the Saxon Emperors.

Fig. 1. Breedon.   Panel (21) on external E. wall

Fig. 2. Breedon.   Panels (23 and 24) on S. Porch

Fig 1. Fletton. Figures (7 and 8) on internal
S. wall of Chancel

Fig. 2. Fletton.   Frieze (1) on NE. buttress
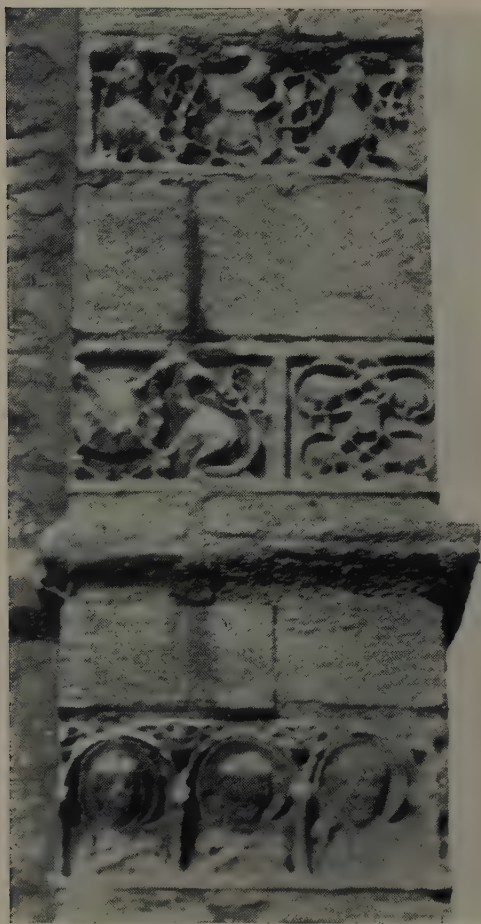
Fig. 3. Fletton. Friezes (2, 4, and 5) on SE. buttress

Fig. 4. Fletton.   Friezes (3 and 6) on SE. buttress

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The third sculptured panel (pl. XXXVII, fig. 1) is set on the outside of the east wall, and is a half-length figure of a man with a cowl or hood over the head, the right hand giving the Greek blessing, and the left, which is covered by drapery, holding a book in a manner similar to the figures on St. Cuthbert's coffin.[1] The figure is set under a round arch resting on side shafts with bulbous capitals and bases. The most remarkable point about the figure, apart from the form of blessing, is the cowled head. The cowl formed part of both the eastern and western monastic habit from quite early times,[2] but it is almost equally uncommon at any period of the middle ages for it to be represented over the head. This is especially remarkable when the figure is represented in the ceremonial act of blessing. It is, however, stated by Palladius that the Egyptian monks of Tabenna wore the cowl at the Eucharist, though it does not appear to be explicitly stated that it was worn over the head. The matter is very obscure, and as it has no direct bearing on the date I will not further pursue the subject.[3]

It remains to notice, briefly, the three arcaded panels of a different nature, and of a different stone from the other carvings, built into the east wall and the porch at Breedon (pl. XXXIX). I am not prepared to dogmatize about these figures but four points may be noticed—one panel is built into a thirteenth-century wall—all the figures have the feet shown in profile—all the figures have deeply drilled eye-holes, and lastly the flat segmental arches are shown notched into the buttress-like supports. The first of these points appears to neutralize the Gothic appearance of the supports which might otherwise point to the thirteenth century or later. The other three points all rather favour a pre-Conquest date.

The feet appear in profile in the figures at Fletton, and in two of the other figures at Breedon; the deeply drilled eyes are a common feature in Saxon figure-sculpture which is not represented to anything like the same degree in post-Conquest work. Finally, the notched joint of the arch is again rather a pre-Conquest feature, and its conjunction with the curious flat arch which is the common form of the panel-heads on the pre-Conquest cross-shafts of the midland counties is also significant.

The figure-sculpture at Fletton consists of two figures (pl. XL, fig. 1) which

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[1] St. Cuthbert's coffin, of 698, is fully described and figured in Haverfield and Greenwell, *Catalogue of Sculptured Stones* in the Durham Library. St. John is similarly shown, with a draped hand holding a book, in Bishop More's Book of Prayers at Cambridge, assigned by Westwood to the eighth century. See Westwood, *op. cit.*, pl. 24. The same convention is preserved in the figures of Confessors and Virgins in Ethelwold's Benedictional.

[2] Cf. *The Rule of St. Benedict*, chap. 55, and the rules of Pachomius in Sozomen's *Eccl. Hist.*, chap. 14. It may be noted that Gunnar and Hagen are represented cowled on the Franks casket.

[3] A figure of very similar technique to the two at Breedon is built into the S. porch at Castor.

are very closely akin to the recently discovered figure at Castor,[1] Northampton-shire (pl. XLI, fig. 3), a few miles away, as the treatment of the drapery and the whole poise of the figures will show. All three figures have the dancing attitude of the feet, the feet both shown in profile, and the same carefully rendered drapery, closely drawn about the figure. The figure at Castor holds a book with a good interlace-panel on the cover; the same figure stands under an arcade with bulbous capitals and curious hemispherical bases. The decoration of the spandrel has a two-leaf sprig of foliage which is almost exactly paralleled in the 'Hedda' stone at Peterborough (pl. XLI, fig. 1). The figures on the Hedda stone have suffered more from weathering than the Castor and Fletton figures, and the drapery is somewhat differently rendered, but the distinctive detail noted above seems to imply an approximation in date. Brøndsted, Reginald Smith, and Prior and Gardner agree in assigning the Hedda stone to the pre-Danish period, and the fourteenth or fifteenth-century Peterborough tradition preserved in the pseudo-Ingulph gives it an almost equally early date. With this date the architectural features and the interlace at Castor fully accord. There are remains of an inscription on the angel-stone at Fletton, in which Mr. Irwin read the name Michael, but I was myself unable to trace it. It may be added that there is yet another stone with two sculptured figures re-used as building material in the west wall of the early twelfth-century south transept at Peter-borough which may be added to the series,[2] though the curious head-dresses point rather to a date towards the close of the Saxon period (pl. XLI, fig. 3).

There remains only the purely constructional point to be considered. The friezes at Fletton are undoubtedly re-used material, cut down and built into two mid-twelfth-century buttresses. It is extremely unlikely, not to say impossible, that costly work of this nature would be cut up and used as building material in a contemporary or nearly contemporary wall. If it be granted that this is rejected material from the neighbouring abbey of Peterborough, a twelfth-century date is equally unlikely, for the twelfth-century abbey church at Peterborough survives intact, and contains, in its structure, not a trace of similar ornament. All the Fletton frieze-stones bear the marks of fire, though no other stone in the fabric is so marked, and it is tempting to see in this the results of the Danish destruction of 870.

At Breedon there is similar structural evidence, though here it is not so strong. The only stone that can be definitely stated to be built in and with the mid-twelfth-century work, is the angel in the tower. It can only be said in

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[1] *Antiquaries Journal*, iv, p. 421.

[2] The conical caps worn by the figures, especially that on the right are exactly parallel in Cott. Claud. B. iv (Ælfric's Paraphrase of the Old Testament), in the drawing of the execution of Pharaoh's chief baker, and in other drawings in the same MS.

this connexion that the placing of a newly carved figure of an angel, high up, in the interior of a tower is a most unlikely proceeding, yet that is the inevitable conclusion if the carving be of twelfth-century date.

To sum up the evidence: both Breedon and Fletton provide a perfectly satisfactory historical setting for pre-Conquest sculpture, and at Breedon, of the pre-Conquest age the pre-Danish period is directly indicated by the facts of the case. Of the work itself, the trumpet-spirals and the diagonal fret almost certainly demand a pre-Danish date; the pelta ornament is only paralleled in English art, so far as I can ascertain, in the eighth century. The interlace is precisely of a pattern with other interlace, certainly of the pre-Danish period. One vine-scroll is exactly paralleled in the Ilkley cross-shaft which no one would suggest to be of post-Conquest date, and which all recent authorities place in the pre-Danish period. These designs carry with them inevitably the figure-carving cut on the same stones, and the identical character of the hollow-cut leaves, on nearly all the remaining items of the series, place them with little doubt in the same age. The Greek blessing in the figure-sculpture is paralleled in English art, so far as I can ascertain, only in the eighth century, and the three examples available are all dated, on quite other grounds, in the latter part of that century. The half-figures of angels and the Anglian beasts are most closely paralleled on the cross at Hoddom, which for political reasons, apart from artistic grounds, must be assigned to the pre-Danish period.

The seven most distinctive details of the Breedon series—the trumpet-spiral, the fret, the pelta ornament, the interlace, the ivy vine-scroll, the Anglian beast, and the Greek blessing [1]—all appear in a very similar form in a single manuscript, the South English Codex Aureus of Stockholm, which is dated with certainty before the Danish invasions, and with probability in the latter part of the eighth century. Any attempt to find more than three of the above details in any one place, at any earlier or later period of English art,[2] would be a waste of labour and, to my thinking, the presence of so many equations, some of them of so unusual a character, is convincing proof of an equation also in date.

On the negative side there is, in both series, an entire absence of the Carolingian acanthus, which almost overpowers the manuscripts of the tenth- and eleventh-century Winchester school, and which maintained its vitality,

[1] All these, except the fret, are illustrated in Zimmermann, *op. cit.* For the fret see J. Belsheim, *Codex Aureus* (Christiania, 1878), pl. II.

[2] A nearly contemporary Carolingian MS., the Lorsch Gospels, assigned to the first quarter of the ninth century, provides parallels to five of these details—the fret, pelta, interlace, Greek blessing, and vine-scroll—with the significant addition of the acanthus, and lends additional weight to the evidence of the rather earlier English MS. See A. Boinet, *La Miniature Carolingienne*, 1913, pls. XV–XXII.

unimpaired, throughout the twelfth century. Furthermore, a careful and exten-
sive, if not an exhaustive, search in twelfth-century carving has failed to reveal
anything bearing more than a superficial resemblance to the Breedon carvings
even in France, while in English work the resemblance is still more remote.
Two of the geometrical motives make no appearance at all in twelfth-century
work, and the other two appear only in quite a different form. The conclusion
is, I think, inevitable, that the carvings at Breedon and Fletton can only be
assigned to the pre-Danish period, the weight of evidence favouring the latter
part of the eighth century, that is to say, the apogee of the Mercian kingdom
under Offa.

We begin thus dimly to see how artistic achievement in Saxon England
followed the path of political power, resting with Northumbria when Northum-
bria was supreme, with Mercia when Mercia was supreme, and finally coming
to rest in Wessex when the house of Cerdic ruled a united England. There
begins also to emerge the framework of a Mercian school of plastic art, which
easily eclipses any contemporary work in western Europe, and gathers to itself
not a few of the best features of what we have been accustomed to call the
Winchester school.

My warmest thanks are due to the Rev. H. E. Moxon, vicar of Breedon,
for his assistance in examining the carvings; to Mr. T. E. Routh for generous
permission to use his admirable series of photographs from which the great
majority of the accompanying illustrations are reproduced; to our Fellow
Mr. P. Chatwin for the use of two photographs, and to the Director, Mr. O. M.
Dalton, and Mr. Reginald Smith for assistance in the preparation of this paper.
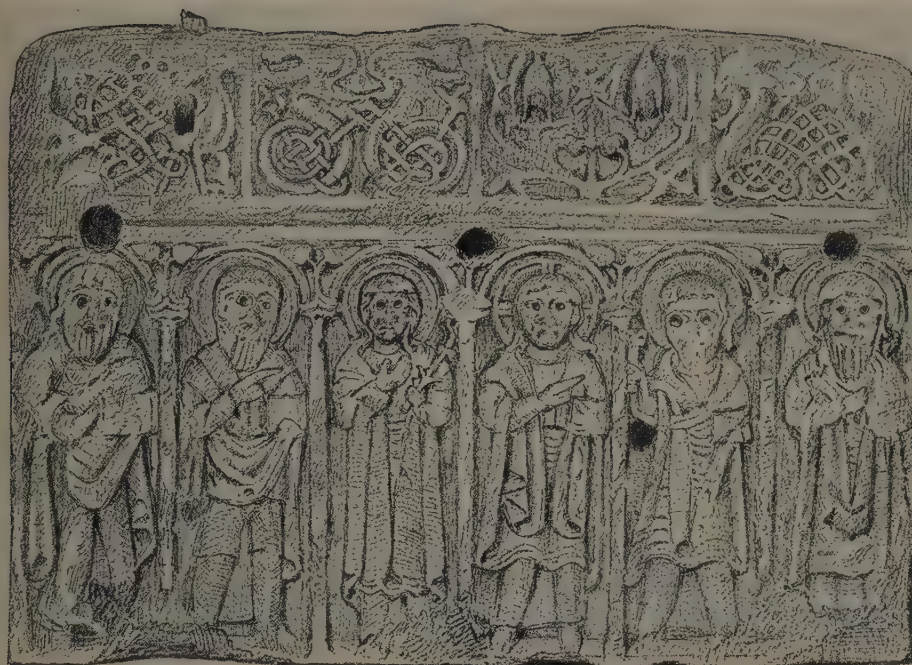
Fig. 1. Peterborough Cathedral.   Hedda's monument, front

Fig. 2. Peterborough Cathedral.   Slab built into masonry of
South Transept

Fig. 3. Stone from Castor

DISCUSSION

Mr. REGINALD SMITH saw revolutionary elements in the paper, and welcomed more specimens of eighth-century art, but was at a loss to understand how such a striking series had escaped notice so long at Breedon. The 'pelta' motive was as rare as it was attractive, but it was possible to recognize in the St. Agnese and Breedon examples a diaper of curvilinear swastikas. A pagan symbol might have been hidden in the pattern, like the cross between the interlacings of the Ripon cross. The intricacies of interlaced patterns had been carefully illustrated by the late Mr. Romilly Allen, but he had not evolved any chronological sequence, and it seemed a field for renewed effort on the part of one or more Fellows. If the Breedon sculptures were of the twelfth century, it was difficult to account for the absence of acanthus foliage, which became common in western Europe after 800, and was popular with the Winchester school late in the tenth century. When it was remembered that the climax of Anglo-Saxon as well as Irish art was reached in the eighth century—even the pennies of Offa were the best of their kind—the Breedon series ceased to be incredible as an Anglo-Saxon achievement of the eighth century; and Mr. Clapham had done well to put the whole on record.

The DIRECTOR said no one present would underrate the importance of the paper. The argument was on new lines but material in its favour had been accumulating in the last fifteen or twenty years. One aspect of the question was susceptible of indefinite exploration. Many learned papers read to the Society were of ethnographic rather than artistic value, but Mr. Clapham had added a chapter to the history of English art, interesting as a record besides being illustrative of the national *ethos*. From imported originals the Anglo-Saxon artist produced both ornamental and figure subjects of extraordinary beauty. Pure ornament was reintroduced into the country full-blown with the revival of Christianity in the seventh century, and fell on fertile ground, especially in Northumbria, where the vine-scroll flourished in association with beasts and birds. Sculpture was another matter, but certainly reached a high level in the Ruthwell and Bewcastle crosses; and it was difficult to trace the origin of such a fine development. The standard could not be maintained in sculpture, though the vine-scroll retained its artistic qualities through many changes. The fortunes of art clearly depended on local prosperity, and southern England eventually gained in both respects at the expense of the north. The carvings at Ramsbury, Wilts. for instance, ought not to date before 900, but showed a survival of much earlier forms. Mr. Clapham had done a service in showing that the great school of Anglian sculpture prospered down to the ninth century.

Mr. QUARRELL inquired about the nature of the stone used at Breedon. The local limestone was of better quality than most, and had the great advantage of resisting the action of water. Till recent years the village had been secluded, but the sculptures outside the church had been at least mentioned in the third volume of Thoresby's *Perambulation*. A word of thanks was due to the clergy of Breedon for the care bestowed on the carvings.

The PRESIDENT had detected a tendency in the paper to assume that all the carvings were

of the same date, and to enrich the eighth century at the expense of the twelfth. To such a view he himself demurred, and recognized three or four separate types of sculpture at Breedon. One was represented by the figure in the act of benediction, and he thought the Greek posture might have been carelessly adopted by the artist even when the Roman was in general use. From the plastic point of view the date was far later than the eighth century; and the Castor figure, for instance, implied great artistic power. Most remarkable of all was the group of a peacock and nude human figure, about which nothing had been said in the paper.

Mr. CLAPHAM replied that he had purposely confined himself to the concrete side of the subject, leaving the appreciation of style and artistic quality to others. The group last mentioned had been passed over in the paper as not being evidential. It behoved the opponents of the scheme he proposed to produce some definite evidence to the contrary, apart from individual appreciation. The material used at Breedon was harder than the Mansfield stone, but he could not be confident regarding its source.

X. *Reculver: its Saxon Church and Cross.* *By* C. R. Peers, *Esq., C.B.E., M.A.,*
F.B.A., Director.

Read 27th October 1927

The history of the monastery of Reculver is short and scanty. The Anglo-Saxon Chronicle records that in 669 Egbert, king of Kent, gave 'Raculf' to Bassa, the mass priest, *mynster to tymbrianne*. Ten years later there occurs a grant by King Lothair of Kent to Brihtwald, abbot of the monastery of 'Raculf', showing that the monastery was then in being. In 692 abbot Brihtwald was made Archbishop of Canterbury, a promotion unlikely to have come to the head of a small and obscure house. In 747 King Eadberht of Kent granted to Abbot Denebach the toll of one ship in Fordwich, and in 761 was himself buried in the abbey church. After that no record survives, except that in 949 King Edred granted Reculver and its possessions to the archbishopric of Canterbury. The abbey may have been laid waste by the Danes; at any rate it had evidently ceased to exist as a monastic house by the tenth century. It continued thenceforward as a parish church, and remained in use till 1805, when on account of its distance from the houses of parishioners it was abandoned and partly pulled down. Its western towers, with their wooden spires, were left standing as a sea-mark, and came under the control of the Trinity House. Finally in 1925 the church and its site were placed in the charge of the Commissioners of Works under the terms of the Ancient Monuments Act of 1913.

Its abandonment being of so recent a date, the records of its appearance when it was still complete are sufficient for a reconstruction of its essential features. It had a rectangular chancel 43 ft. by 24 ft. of early thirteenth-century date, a nave 37 ft. by 24 ft. with north and south aisles and porches, and western towers. The nave arcades and the west front, with the towers, were of late twelfth-century date, the upper parts of the towers having been partly rebuilt in the fourteenth century. Each tower was finished with a wooden spire, leaded. To the last it retained a striking feature, witnessing to its early story, in the arcade of three semicircular arches of Roman brick springing from lofty circular stone columns, which divided the nave from the chancel. Their plan and elevation are preserved in drawings, now in the Society's possession, made while they yet stood, but by a fortunate chance the columns themselves, with their capitals and bases, still exist, and now stand in the Infirmary cloisters of Canterbury Cathedral (fig. 5). The demolition of the church, while otherwise greatly to be deplored, has at any

rate made it possible to examine its remains thoroughly and to trace its early plan in a way which would have been impossible if it had continued in use.

In a paper lately read before the Society by Mr. Clapham and myself on St. Augustine's Abbey at Canterbury, it was shown that there existed on the site of the monastic church considerable remains of what was undoubtedly the
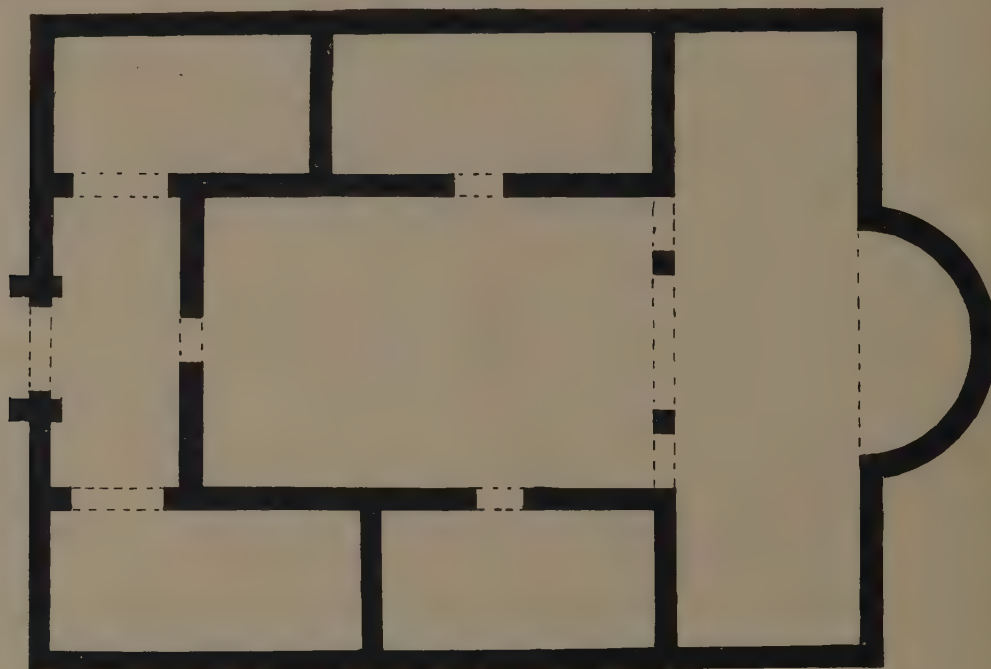
Fig. 1.   St. Augustine's church, Canterbury: ground plan. $\frac{1}{24}$" scale.

church begun by St. Augustine at the end of the sixth century and finished after his death, about 613.[1] A comparison between its plan (fig. 1) and details and those of several other churches connected with the early days of Christianity in south-eastern England, namely St. Martin's and St. Pancras's, Canterbury, St. Andrew's, Rochester, and St. Mary's, Lyminge, in Kent, and Bradwell-on-Sea in Essex— all of which I had described in the *Archaeological Journal* in 1902, calling them the St. Pancras type—showed certain features which might be considered characteristic of the group.   Their walls were notably thin, but this is common in pre-conquest churches of much later date.   St. Pancras, being in some ways the best preserved, shows a rectangular nave with buttressed angles, north and south chapels, and a west porch (fig. 2).   To the east it opened to an apsidal chancel by a brick arch carried on stone columns, Roman work re-used, and flanked by narrower openings which may have been arched or lintelled.   The shape of the eastern apse is only conjectural.   The walls are built of Roman brick as far as

[1] *Arch.*, lxxvii, p. 201.

they are preserved.   St. Martin's, in the south wall of its chancel, preserves part of the south wall of an early church, having a lintelled opening to a south chapel, and a brick buttress at the SE. angle of its nave.   To the east the former existence of an apsidal chancel may be conjectured, but there is no
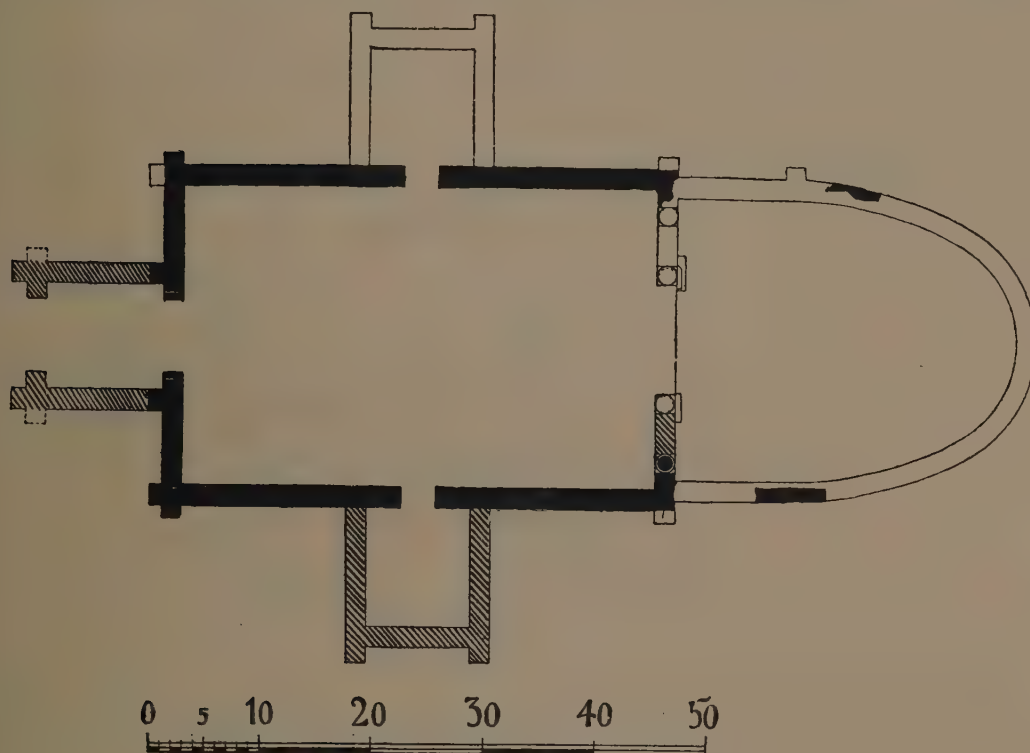
Fig. 2.   St. Pancras's, Canterbury: ground plan.

direct evidence (fig. 3).   The original church was enlarged by the addition of a rectangular nave 38 ft. by 24 ft. 6 in., having pairs of buttresses at the angles and one in the middle of the south wall.   The older masonry, as at St. Pancras, is chiefly of Roman brick, but in the addition, which is possibly not of much later date, roughly squared chalk blocks are used, with a sparing use of Roman brick in single courses.   The sloping heads of the buttresses were also built with Roman brick.

At St. Augustine's Abbey the early walls are built in Roman brick, while the later additions, as far as anything can be said of their construction, show the use of rough stonework.   What remains of the west wall of St. Mary's church, to the east of St. Augustine's church, is also of Roman brick.   It is probably part of the oratory built in 616 by King Edbald of Kent.   All this goes to suggest that these first Kentish churches belong to a school of brick building,

but since we have no reason to suppose that bricks were being manufactured in Kent at the time, the technique would depend on the supply of Roman bricks from old buildings, and when these failed would have to be modified by the use of stone for walling, brick being reserved for structural features such as arches, doorways, and windows. It must be remembered that this is a matter of structure and not of aesthetics, for it is clear that the masonry was plastered within and without, and was entirely hidden from view when the churches were perfect. Whether this plaster was marked out in courses to represent squared
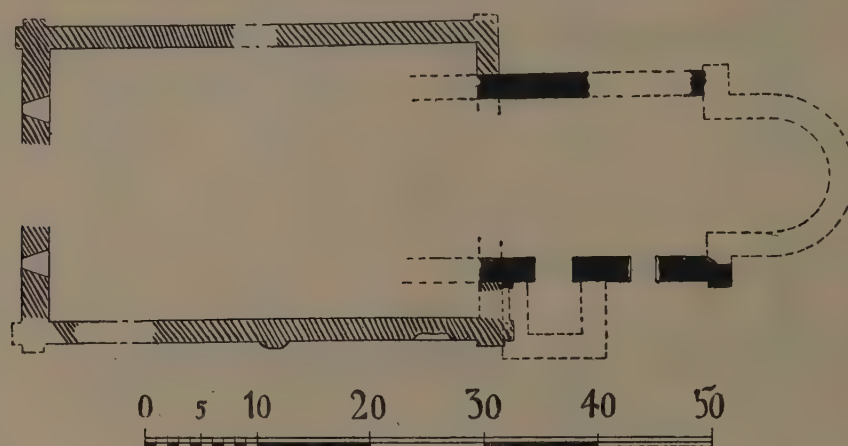
Fig. 3. St. Martin's, Canterbury : ground plan.

stonework is a question on which I must not enter here, more particularly since there is not any evidence available on the point, so far as I know. The clearing of the site at Reculver shows that the first church consisted of an apsidal chancel 24 ft. wide by 23 ft. 6 in. deep, the apse being polygonal of seven sides externally, but semicircular within, north and south porticus 17 ft. by 9 ft., and a nave 37 ft. by 24 ft. (fig. 4). The walls are thin (2 ft. 4 in.) and composed of flint and stone rubble with wide joints of a coarse pebbly mortar of excellent quality. The window dressings are of brick, and old drawings show that the walls were banded with brick courses three deep. The nave had north, south, and west doorways, each flanked by two buttresses, and there were pairs of buttresses at the western angles. The chancel had doorways at NW. and SW., opening to the porticus, each of which had a doorway in its east wall. Careful excavation to the east of these doorways failed to show any sign of a contemporary building into which they opened, so that they must be considered external. The walls of the north porticus are preserved to a height sufficient to show that it was lighted from the north by two small windows with single inward splays. Between nave and chancel was the triple arcade already mentioned. The arches were semicircular, single rings of Roman brick, and the

SCALE OF FEET.
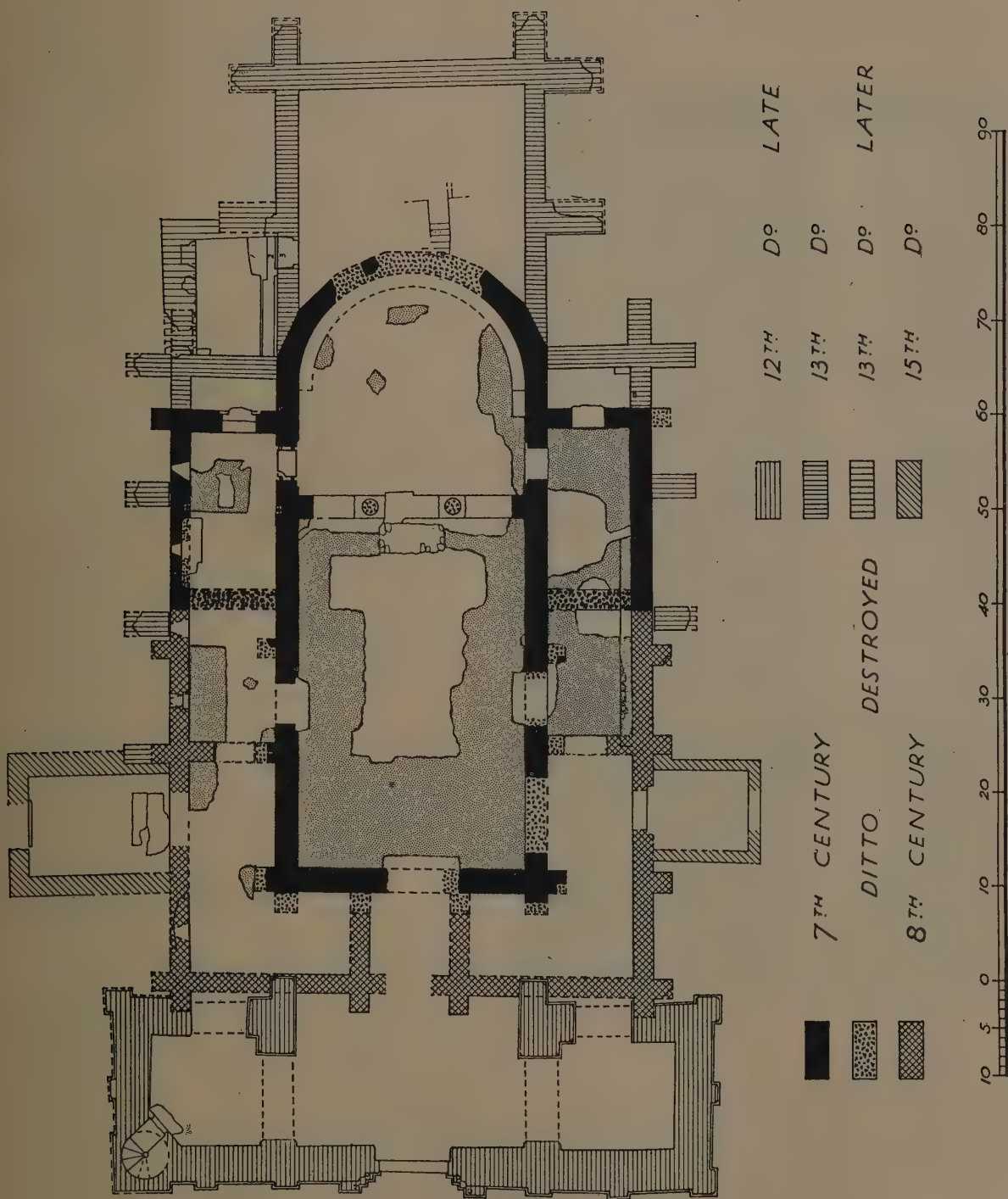
Fig. 4. Reculver church: ground plan.

7TH CENTURY

DITTO. DESTROYED

8TH CENTURY

12TH   D?   LATE.

13TH   D?

13TH   D?   LATER

15TH   D?

responds were square, of stone banded with brick.   The two columns were 14 ft. 9 in. high in all and had tapering shafts 12 ft. 4 in. high, with a bottom diameter of 2 ft. 3 in. tapering to 1 ft. 11 in. at top, and rested on bases reminiscent of classic models, with key pattern and cable moulds (fig. 5).

Fig. 5.   Columns from Reculver now at Canterbury.

The capitals are curiously clumsy, with three horizontal bevelled members passing from a circle at the necking to a square at the spring of the arches; their uncouthness may have been in some way relieved by painted ornament. We have nothing like them elsewhere, and the two early capitals found at St. Augustine's, clumsy as they are, show a much closer knowledge of classic models.

The doorway from the chancel to the north porticus has been lined with upright stone slabs, the sills for which remain, having pairs of fillets worked on them, intended to fit into grooves in the beds of the upright slabs and thus retain them in position.   Towards the chancel the jambs are rebated for the insetting of vertical stone strips, and the same feature occurs in three other doorways, the north door of the nave, the east door of the north porticus, and the south door of the chancel, in each case on one face only.   The resemblance to the work still existing in the two early archways on the north and south of the nave of Britford Church, near Salisbury, is to be noted.   And the west doorway of St. Mary's Chapel at St. Augustine's, Canterbury, is similarly rebated.   A good deal of the original floor, of the same character as that at St. Augustine's, remains. It is very solid, about 10 in. thick, of mortar set on a foundation of rough flints, and finished with a thin layer containing pounded brick.   Old descrip-

tions of the church call it 'a kind of tarras'. Both at St. Pancras's and St.
Martin's are remains of similar floors, and the excavations made this summer in
the nave of Glastonbury Abbey have disclosed another example, bedded on
pieces of tufa and limestone. At Reculver the greater part of the nave floor is
preserved, and the chancel and porticus also retain a fair quantity. The nave
floor is 8 in. below that of the chancel, the step being on the west face of the
sleeper wall carrying the triple arcade. Round the inside of the apse runs the
base of a stone bench, but there is no trace of the position of the high altar of
St. Mary, the ground in the apse having been so much disturbed by graves.
In the porticus the floor remains perfect in front of the eastern doorways, and
there were clearly no altars at these points. It remains to notice a masonry
foundation at the east end of the nave, set centrally in front of the middle span
of the triple arcade, and contemporary with the plaster floor, which stops
against it on the north and south sides. To the significance of this I shall
return later.

This first church was enlarged by carrying the lines of the two porticus
westward and returning them across the west end of the nave, forming at the
same time a porch over the west doorway. The nave walls were not, however,
pierced with arcades, but remained intact, so that the additions took the form
of rooms enclosing the old nave, and communicating with it only by means of
the pre-existing doorways. The outer walls are provided with buttresses like
those in the original work, and on the north side retain parts of three windows
of the same character as those in the north porticus. The walling is of coursed
blocks of stone, roughly squared, and brick seems to have been used in the
buttresses. The floors of the additions were of the same kind as before. From
the general likeness to the first work, one may hazard the suggestion that the
addition is not more than a century later, and the resemblance of the completed
plan to that of St. Augustine's is to be noted. A sidelight on its date may be
thrown by the existence of a small plastered opening, with a double splay and
chase for a pierced wooden board or *transenna*, inserted below one of the
windows in the north wall of the added portion. Double splays belong in this
country at earliest to the end of the ninth century, and continue through the
tenth and eleventh, being characteristic of the later phases of pre-conquest
architecture.

No trace of any building set against the church on the north side, or else-
where, has been found, and in this connexion it is interesting to note that in this
seventh-century monastic house, as at St. Augustine's, Canterbury, the church
is planned as a separate building, unconnected with any other monastic offices,
whatever form they may have taken. In the two early Canterbury monasteries,
St. Augustine's and Christ Church, the cloister is on the north of the church,

and was so in Saxon times.   At Reculver we may note from drawings and records the existence to the north of the church of an ancient building with brick arches, now destroyed by the inroads of the sea.   Accounts of it are not sufficiently precise to be relied upon, and we shall never now know whether the building was of really early date.   The record of its existence should, however, be preserved.

Such, then, was the Saxon minster of Reculver, and its relation to the other early Kentish churches needs little demonstration.   But the closest parallel to
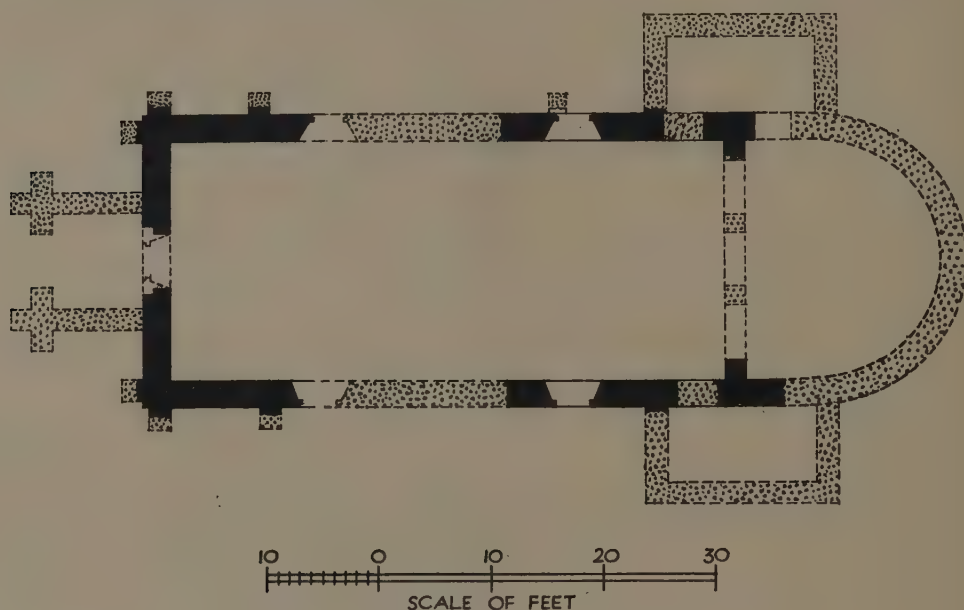
Fig. 6.   Bradwell-on-Sea : ground plan.

it, in some ways, is to be found in the church of Bradwell in Essex, the nave of which remains almost entire, by singular good fortune (fig. 6).

It is 49 ft. long by 21 ft. 6 in. wide, built of courses of roughly squared stone, and having buttresses with brick heads.   It had a western porch and doorway, and may have had north and south doors to the nave, but the walls at this point have been destroyed when the building was used as a barn.   The apsidal chancel has been destroyed to the foundation, but was of the same width as the nave and 17 ft. deep, opening to the nave by an arcade of three, or perhaps only two, brick arches of a single order.   There were chambers on the north and south, overlapping the junction between nave and chancel, as at Reculver, and one jamb of the door opening to the north chamber remains at the north-west of the chancel.   That to the south chamber seems to have been west of the arcade, opening from the nave.   It has been considered that this is the church built about 653 by St. Cedd on his mission to Essex, as related by Bede, and its seventh-century date is

generally accepted. The nave walls at Bradwell are 23 ft. high to the plate level, having four square-headed windows set high in the wall. The same arrangement may have existed at Reculver, where high windows to light the nave must have been necessary after the addition of the surrounding chambers, if they were not there from the first. And it is obvious that the nave of St. Augustine's must have had high-set windows on north and south from the first, as its side chambers are of one build with the rest.

With regard to the apse, which at Reculver is polygonal without and semi-circular within, it may be noted that while no evidence of the shape of the eastern termination remains at St. Martin's, or at St. Augustine's, there is evidence of a semicircular apse at Lyminge, an elliptical apse at Rochester, and perhaps at Bradwell, and an apse of uncertain shape at St. Pancras's. But it must be noted that in all these cases the foundation courses alone remain, and that at Reculver the polygonal form ends at the ground-level and has semicircular foundations without as well as within, so that the possibility that some others of these early apses were polygonal must be borne in mind.

There exist in England, besides Reculver, three other polygonal apses, at Brixworth, Wing, and Deerhurst. The two latter are polygonal within and without, with rib-work at the angles, but Brixworth, like Reculver, is semi-circular within. It differs, however, in having external rib-work, like Wing and Deerhurst.

Now Brixworth is claimed to be the church of a cell of Peterborough, founded in 685, and shows undoubtedly early features, including evidence of a triple arcade between nave and chancel. Its plan is, however, much more developed than that of Reculver, and altogether on a more ambitious scale. The apse is largely a modern restoration, though its lines are certain, and the use of tufa in the old work has been held to show that it was rebuilt in Saxon times, as tufa only occurs elsewhere in the church in the western staircase, which is part of a tenth-century addition.

Wing and Deerhurst both show an approximation towards the cruciform plan and can hardly be earlier than the tenth century, but it is interesting to note that the seven-sided polygonal form adopted at Reculver is to be found at Wing and Brixworth, while the apse at Deerhurst is five-sided. But this, in view of foreign parallels, is rather evidence for the long duration of the form than of an advanced date, and in no way invalidates a seventh-century attribution to Reculver.

The external doorways in the east walls of the porticus at Reculver may throw some light on the openings in the east walls of the rudimentary transepts at Deerhurst. Mr. Knowles, in a paper read before the Society last session,[1]

[1] *Archaeologia*, lxxvii, 141.

assumed these openings to be insertions, made when small rectangular chambers were added to the east of the transepts. I have never been able to accept this explanation, and am the more confirmed in my opinion by the undoubted eastern doorways at Reculver.

To sum up the architectural evidence, Reculver, while clearly akin to the earliest Kentish churches, those with walls of brick, more closely resembles in construction and plan the later members of the group, that is to say the nave of St. Martin's, Canterbury, and Bradwell. The latter seems to belong to the third quarter of the seventh century, a date precisely in accordance with the recorded history of Reculver. We may, I think, with some confidence conclude that we possess the actual remains of Bassa's church, begun about 670 and enlarged after no long interval of time, perhaps soon after the year 700.

In the course of my description I referred to a masonry foundation immediately west of the chancel step, in front of the middle arch of the triple arcade, and remarked that it was of the same date as the plaster floor. When, in or about 1540, John Leland visited Reculver, he saw in the church something which roused him to an enthusiasm seldom displayed in his records.

'The old building', he says, ' of the chirch of the abbay remayneth having ii. goodly spiring steples. Yn the enteryng of the quyer ys one of the fayrest, and the most auncyent crosse that ever I saw, a ix. footes, as I ges, yn highte. It standeth lyke a fayr columne. The base great stone ys not wrought. The second stone being rownd hath curiusly wrought and paynted the images of Christ, Peter, Paule, John and James, as I remember. Christ sayeth *Ego sum Alpha et ω*. Peter sayith *Tu es Christus filius Dei vivi*. The saing of the other iii. wher painted *majusculis literis Ro*. but now obliterated. The second stone is of the Passion. The iii. conteineth the xii Apostles. The iiii. hath the image of Christ hanging and fastened with iiii. nayles, and *sub pedibus sustentaculum*. The hiest part of the pyller hath the figure of a crosse.'[1]

This very notable monument is only, so far as I know, once again mentioned, and that is in Archbishop Winchelsey's Register,[2] under the date April 11, 1296. In this is recorded an ordinance made between the vicar of ' Reycolure' and the parishioners, *super oblacionibus seu elemosinis in quodam trunco juxta magnam crucem lapideam inter ecclesiam et cancellum repositis.*

We have, then, to do with a large and richly carved stone cross, standing between the nave and chancel, in the entering of the quire. This might imply a position on the chancel step, under the middle arch, or immediately west of it, and we may take the existence of the masonry foundation in the latter position as evidence that this latter was actually the case. If then, as is only reasonable to suppose, the cross stood on a foundation already shown to be contemporary

[1] *Itinerary*, ed. Toulmin-Smith, iv, 59–60.   [2] *Cant. and York Soc.*, p. 87.

with the original floor of the nave, we have an argument for the date of what to Leland was 'the fayrest and most auncyent' cross that ever he saw. It was presumably destroyed by sixteenth-century iconoclasts, and nothing more is recorded of it. But it happens that in the modern church of Reculver (Hillsborough), a mile inland from the old church, there are preserved five carved fragments of stonework belonging to a round shaft, and in the old church have been found part of a cross-head and one more small piece of carving, which, as I hope to show, may reasonably be held to be the remains of this cross. Patches of mortar on them show that they have been used as walling material, and they presumably came to light when the old church was pulled down early in the last century.

Four of the stones belonged to a round shaft 18 inches in diameter, while one gives a diameter of 15 inches. On each stone either the lower or the upper bed exists, agreeing with Leland's description that the shaft was built up in courses and was not a monolith. The largest fragment is 1 ft. 1½ in. high, and consists of half of a circular shaft which must have been divided into six panels by vertical ribs, and has in the centre of the shaft a round dowel hole 2 in. in diameter. This seems to have occurred in each course, and the fragment of the cross-head has a similar hole.[1] Each panel contains the lower half of a draped figure, two complete [2] and two fragmentary. Having lost their upper halves, the figures cannot be identified, and only in one case is any particular detail clear. This is in the left-hand complete half-figure, who holds in his left hand a partly unrolled scroll. Each figure wears a long cloak which falls in elaborate folds over an under-dress reaching to the ankles and leaving the feet bare. The backgrounds of the panels show signs of red paint, and the fronts of the vertical ribs are countersunk for metal strips, which seem to have been fastened by pairs of pins at intervals.

This is presumably half of Leland's second stone, which 'being rownd hath curiusly wrought and paynted the images of Christ, Peter, Paule, John and James', as he remembered. There should have been six figures to complete the scheme, but Leland was writing, as he said, from memory, and may merely mean that he could only remember five figures. Of the position of the inscriptions we remain in ignorance. They may have been on the metal strips, but we cannot say, and the fact that three of the 'sayings' had been painted and were defaced in Leland's day is not in favour of this solution. One may hazard a guess that the figure with the scroll is Christ, and that next to Him is Peter. Beyond that we cannot go (pl. XLII and fig. 7).

[1] A drum of a round shaft, with knotwork of good and early character, in the south porch of Wantage church, Berks., has a similar dowel hole in its lower bed.
[2] The feet are partly or wholly cut away in every case.

Stone no. 2 shows two standing figures separated by a scroll or stem (pl. XLIII). Both appear to stand on rocky ground, and face each other. The left-hand figure strides forward with one arm raised and has held a staff or perhaps a spear of metal, the holes by which it was fastened to the stone being clearly seen. He wears a cloak, tunic, and girdle, and has bare feet: the head and one

Fig. 7. Stone no. 1, centre.

arm are broken away. The second figure is more damaged; one knee shows in low relief behind the stem, and one foot, on the uneven ground, is well preserved, but little more can be said.

Stone no. 3 shows parts of two winged and draped figures, back to back, and leaning forward away from each other (pl. XLIII). The bare feet and drapery are of the same character as before. In front of the right-hand figure is a rectangular block of stone, on which is a left hand and part of an arm, seen from the back and sloping downwards. The position and the scale, in comparison with the two figures, seem to forbid the idea that this is part of a crucifixion. Above the block, and also below the wings of the figures, are round objects which do not seem to be part of the drapery, but I can offer no explanation of them.

Stone no. 4 has two standing figures, shown in full face and separated by a slender shaft with a Corinthian capital, carrying a plain entablature which
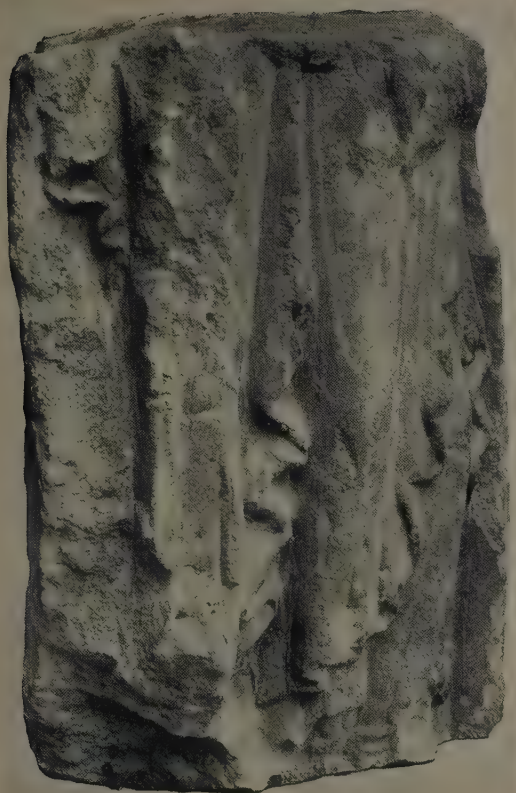
Left

Half left

Half right Reculver Cross. Stone No. 1, four views

Right

No. 2 left

No. 2 right

No. 3 left

Reculver Cross. Stones nos. 2 and 3

No. 3 right

frames the scene (pl. XLIV). The right-hand figure is much worn away, but the head seems to be veiled and perhaps nimbed, and to be that of a woman. The left-hand figure is of a bearded man, with a cloak over his left shoulder. The lower part of both figures is broken away.

Stone no. 5 is of different character from the rest, and is part of a round drum 1 in. in diameter, as against 18 in. in all the others (pl. XLIV). It has the 2 in. dowel hole in the middle of the shaft. On the left is part of a rectangular panel enclosing a winged figure: on the right is a vine scroll with human busts filling the curves of the stem. The upper bust, which is complete, has a beardless
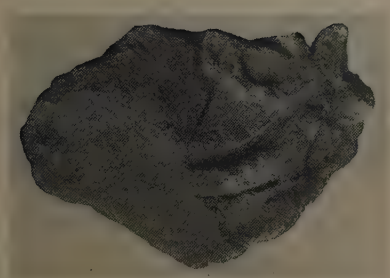
Fig. 8. Stone no. 6.
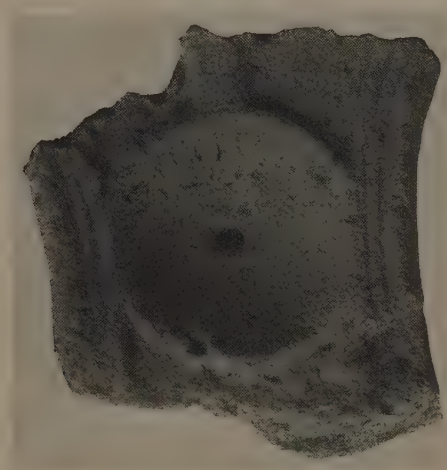
Fig. 9. Stone no. 7.

head with hair arranged in formal curls on the forehead: the pupils of the eyes are hollowed out and were perhaps filled with some material. The lower bust shows part of the head only. Between the panels is a band of knotwork, which is returned horizontally above them.

Stone no. 6 (fig. 8) is a small fragment of vine scroll like that on no. 5.

Stone no. 7 is part of the arm of a cross-head, and, having a dowel hole in it, was presumably one of the vertical arms (fig. 9). The arms were of the expanded type with beaded edges showing traces of red paint, and the ornament is a con-cave disc with a small hole drilled in the centre. A plain fillet runs from the edge of the disc towards the end of the arm. It seems possible that there was a metal plate in the disc, secured by the hole in the centre.

It is difficult to identify any of these stones with the subjects given by Leland, namely, the Passion, the Apostles, or the Crucifixion: but it is clear that the shaft was surmounted by a cross which was either plain or bore no carvings which he thought worthy of description.

A restoration of the original design seems beyond our power, and no two pieces will join together. Are all the stones part of one shaft? Nos. 1 to 4 are all of the same diameter, with figure subjects of good classic style and generally resembling each other in treatment. Stone no. 5 is of smaller diameter and has knotwork ornament which none of the others has, but the remains of the winged figure show drapery closely resembling that on the other stones, and the busts in the vine scroll are distinctly classic in treatment. There is no real reason, on grounds of style, to separate it from the rest.

As to the stone itself, I have submitted the only piece over which I have control, the arm of the cross-head, to the authorities at Jermyn Street and at the Natural History Museum in Cromwell Road.

Mr. Allen Howe, of the Jermyn Street Museum, reports thus:

The block of stone received with your letter of today is a limestone containing fossils which indicate that it came most probably from the Mediterranean region, perhaps from Italy.

There is only one place in England where a similar fossil is found and the rock does not resemble this specimen.

Mr. Cox, of the Natural History Museum, says:

The fossils in this rock include, I find, the foraminifer *Alveolina* (in the small box) and the lamellibranch *Lucina mutabilis*. These establish a Middle Eocene age for the rock, and also confirm the opinion that it is not British. It comes most probably from the Calcaire Grossier of the Paris neighbourhood; this stratum has, in the past, been used considerably for building. The Calcaire Grossier varies considerably in lithology, being most familiar as a limestone full of well-preserved shells. At some localities, how-ever, the shells are preserved only as internal casts, as in the present specimen. I have not been able to match the rock absolutely with any of our specimens, but we only have material in which the fossils are well preserved. A Paris authority could, I expect, tell you the exact locality.

The possibility of its being an Italian rock is not out of the question, of course, since beds of the same age, containing the same fossils, occur in some Italian localities, but I think that the probable locality is in France.

So that while agreeing on the stone, they differ as to its provenance. A French origin would be perfectly natural at Reculver, and it must further be remembered that the site being that of a Roman coast fortress, the stone may be Roman material re-used. If it proves possible to identify the other stones now in the new church at Hillsborough, it will be of interest to record the result, but not, I venture to think, important as affecting the origin of the cross itself.

The scarcity of early stone carvings in the south of England, contrasting with their abundance in the north, has long been a matter of real regret to historians and antiquaries. Arguments based on the comparative lack of good

No. 4

No. 5 right

No. 5 centre

No. 5 left

Reculver Cross. Stones nos. 4 and 5

freestones are not convincing, and personally I cannot but believe that it is rather a matter of ill fortune than of paucity that so few now remain. As it is, we have nothing in the south with which the Reculver sculptures can be compared, and we must go to Ruthwell and Bewcastle in the north for parallels. The great cross now standing in the church at Ruthwell, and the other which remains in the little churchyard of Bewcastle, on the site where it was set up more than 1,200 years ago, are monuments of prime importance in the history of English art. Their elements of decoration are three: figure sculpture, the vine scroll with animals, and knotwork. The first two have no place in pagan art, and must be considered due to the reintroduction of Christianity to Britain. The third represents the contribution of the native artist. The date of these crosses has been much debated, but on all grounds the end of the seventh century seems most appropriate. Their art being in the main an introduced art, it is fair to take its standard as a measure of date. Whether such an art will take root and develop in its new surroundings depends on the national genius, and the evidence of the monuments in north Britain is conclusive against any such development. It is fair to say that the best specimens of figure sculpture will be the earliest, and also that the gradual supersession of the introduced technique by work of native inspiration can equally be taken as a chronological test. It is possible to apply this to the two crosses themselves, for at Ruthwell there are only figure sculpture and the vine scrolls, while the lettering is in a form of Roman capitals. At Bewcastle knotwork patterns occur, the general arrangement is less systematic, and Anglian runes are in much evidence.

At Reculver, if we include all the stones described here, the same three elements, figure sculpture, vine scrolls, and knotwork are to be found, and we know from Leland that Roman lettering was used in the inscriptions.

But to my eyes the classic treatment of the figure sculpture is more pronounced than at Ruthwell, showing more knowledge and skill—being in fact nearer to its classic prototypes. The vine scroll contains human busts instead of animals, and here also the classic feeling is strong, though the treatment of the vine itself is not so brilliant. The knotwork, of simple character, is not against an early date and supplies the contemporary native element. In fact there seems nothing in the style of the work against the late seventh-century date which the architectural evidence suggests, and I think we may claim that this cross was put up by the first builder of the monastery of Reculver not much after the year 670.

It remains to inquire why it was put up in such a position, to which I have been unable to find any parallel. Crosses were put up for many reasons, as to mark a place of assembly, religious or secular, to define a boundary, to com-

memorate an event or a person.   The Bewcastle cross tells its own story.   This sign of victory, say the runes on it, Hwaetred and Wothgaer set up in memory of Alchfrith, a king, and son of Oswy; pray for his soul.   At Reculver there seems to be no memorial intention; it is a great Rood, bearing conspicuously the emblem which naturally predominates, that of the Crucifixion.   That it stood in the place normally occupied in later days by the Rood in all churches may be of real significance, but it is interesting to note that at the end of the fifteenth century, while it still occupied its original place, the parishioners of Reculver set up a rood and rood-loft, with Mary and John, against the arcade in front of which it stood.

XI.—*Some Clocks and Jacks, with Notes on the History of Horology.* By
R. P. Howgrave-Graham, *Esq.*

Read 4th November 1926

WATER AND ESCAPEMENT CLOCKS

Ancient Horology is a fascinating but most difficult study, hampered by imperfect observation, the repetition of gross errors, and the free acceptance of mere tradition; so wide and deep is the confusion that careful students have now become cautious and sceptical even in accepting fairly admissible evidence. A contributory factor has been the undue separation of mechanical and artistic considerations, for mechanicians have attempted to form judgements based solely upon technical peculiarities, while artistic antiquaries have perhaps shunned the dark and oily wheels and levers hidden away in the dusty clock-chamber or tower. Certain types of clockwork cannot be dated unless there is ornament, but due attention to records, to mechanism, and to ornament, makes it at least possible to correct many erroneous traditions and false theories.

Individual examples cannot be fairly considered except in the light of the clearest possible ideas as to the development of the true clock or 'regulated horological machine' and it now seems necessary to revise and perhaps largely to discard the current theories as to the nature of the clocks in use in Europe between 1120 and 1368. Mr. G. H. Baillie, who has done much original work in accumulating valuable documentary evidence relating to this period, holds the revolutionary view that the weight-driven clock was unknown until about 1300, that its use spread steadily across Europe from Italy, and that it did not reach England until about 1368. He considers that all the records earlier than these dates refer to water-clocks and not to the weight-driven escapement mechanisms that have hitherto been assumed to exist all over Europe from the thirteenth century onwards. This startling theory, which would involve wholesale modification of existing ideas, requires thorough justification, and Mr. Baillie, with the present writer, has spared no effort in sifting the evidence for and against it. He cites the *Libros del Saber de Astronomia* (of Alfonso X ?), *circa* 1285 ; this shows a variety of clocks, in none of which is there anything characteristic of the true escapement type. The case in favour of it is in many ways strong, and it is to be hoped that the work will be carried forward to some satisfactory conclusion, and published either in his forthcoming book on *Watches*, or elsewhere.

Water and sand clocks are differentiated from those driven by weights or springs, in that the common aim of securing the indication or warning of definite time intervals is attained in the one case by the steady flow through an orifice of a substance such as water or sand having fluid or pseudo-fluid properties, and in the other by the intermittent and rhythmic release of the energy stored in a weight or spring arranged to rotate a train of wheels. Setting aside the theory (little more than a guess) that the earliest weight-driven clocks were retarded by some sort of friction device or fly, it is clear that the weight-drive necessitates means for regular retardation, i.e. an escapement, the best device for providing this being an oscillatory part receiving its impulses from the falling weight, and at the same time imposing a step by step movement upon the train. It must not be forgotten, however, that water-clocks of the falling-drum type, like one exhibited in the Science Museum at South Kensington, are weight driven, and but for the difficulty of adjustment could be made to indicate on a dial by mounting the drum on a spindle carrying a hand, and winding the weight-cord on the spindle. Some such weight-driven water-escapement horologes may have been transitional types. The water-clocks described in works of the Classic Period were called *Clepsydrae*, and as the earliest known appearance of the word 'clock' in English coincides with the date at which the existence here of balance-controlled clocks is beyond dispute (all previous records referring exclusively to horologes or the equivalent), I propose to refer throughout to water-clocks as 'clepsydrae', to weight-driven escapement-clocks as 'clocks', and to time-measurers of uncertain nature as 'horologes'.

Historical treatment of the matter does, in fact, derive its chief difficulty from vague terminology, and, above all, from the very wide application of the Latin word *horologium* and its numerous forms (twenty in number in English usage alone). This word has been freely assumed to mean a clock, but Mr. Baillie holds that it meant a clepsydra or a sundial in all known English records before a date close to 1368. Examples from *The Oxford English Dictionary* show (*a*) the variants of the word, and (*b*) its different applications (quotation expanded in one case).

(*a*) *horologe, orlogge, orloge, orlege, orlage, orlegge, orlyge, horlege, orlache, horleige, orologge, oriloge, orologe, oryloge, orrelegge, horolage, horalage, horyloge, horrelage, horologue* (I add *horlog and horilog, horology*).

(*b*) **1382.** WYCLIF.
'The shadewe of lynes by the whiche it hadde go doun in the oriloge' (clearly a sundial).

1386. CHAUCER.

> 'Wel sikerer was his crowyng in his logge,
> Than is a clokke, or an abbey orlogge.'

1413. *Pilgrimage of the Sowle* (Caxton 1483), 'And by this tyme the Horologe had fully performed half his nyghtes cours'. Probably, at this date, a clock but possibly a clepsydra.

c. 1449. REGINALD PECOCK (Bishop of Chichester in 1450), *The Repressor of Over Much Blaming of the Clergy*—' or that men schulde make and use clockis forto knowe the houris of the dai and ny3t ; for thou3 in eeldist daies, and thou3 in Scripture mensioun is maad of orologis, schewing the houris of the dai bi schadew maad bi the sunne in a cercle, certis neuere saue in later daies was eny clok telling the houris of the dai and ny3t bi peise and bi stroke, and open it is that nou3where in Holi Scripture is expresse mensioun mad of eny suche.'

SIR THOMAS MORE, *7th Pageant of Tyme*, 'I, whom thou seest with horyloge in hande, am named Tyme'. Probably a sand-glass.

Besides all these a delightful coined word, used in the Wimborne records of 1442, is quoted by our Fellow the Rev. R. Grosvenor Bartelot, in a paper referred to below. The actual word *horacudii* is presumably the genitive of *horacudius,* an 'hour-striker'.

The Pecock quotation is valuable as containing a very early reference to a driving weight ('peise'), but it has further special interest as it seems to distinguish definitely '*clockis*' working by 'dai and nyght' and by 'peise and bi stroke' from '*orologis,* schewing the houris of the dai bi schadew maad bi the sunne in a cercle'. Against this Lydgate, *Minor Poems,* c. 1430, Percy Soc., has 'Lyk an horloge whan the peys is goo'. A similar differentiation might be inferred from Chaucer's words, though it is characteristic of his method to use repetition for poetical purposes. The association of his 'clokke' and 'orlogge' with the crowing of Chauntecleer certainly suggests a bell-ringing mechanism, but, even so, he might have intended to distinguish between a clock and a clepsydra. In the oft-quoted Rule of the abbey of Citeaux, *c.* 1120, is prescribed the sacristan's duty of so adjusting the abbey horologe, that it may strike and awake the monks for Matins. This is clearly a kind of alarm or 'morning-caller', but there is no clue to its nature, and it has been maintained that it was a clepsydra and that clepsydrae could be, and were, devised in which the attainment of a certain level by the water caused the release of some percussive device, as for instance, a ball arranged to drop upon a gong or bell. Here the great difficulties of the subject begin, and it is indeed astonishing how little detail avails to show the actual construction of early medieval time-measurers. The author inclines to the view that the Citeaux horologe was a primitive clock, partly because, while the development of early inventions is always very slow, we have evidence of an advanced type of clock in Italy only two centuries later, in Dante's *Paradiso.* The manner in which the poet's references are given, considered with his habitual methods of illustration, suggests that he assumed familiarity with clocks in his readers' minds, and this would

argue not only the existence of a number of privately possessed clocks, or of a few in public places known to a majority of his public, but a state of considerable development before the date of writing.   The late Dr. Philip Wicksteed pointed out to me that the date can be closely placed, as a letter exists proving that Dante had not written the *Paradiso* in 1318; this fixes the references between the years 1318 and 1321, when he died, almost exactly 200 years after the writing of the Rule of Citeaux.

DANTE : *Paradiso*, Canto X (Temple Classics Trans.) : 'Then as the horologe, that calleth us, what hour the spouse of God riseth to sing her matins to her spouse that he may love her, wherein one part drawing and thrusting other, giveth a chiming sound (*tin tin sonando*) of so sweet note, that the well-ordered spirit with love swelleth.'

Paradiso, Canto XXIV : 'And even as wheels in harmony of clock-work so turn that the first, to whoso noteth it, seemeth still, and the last to fly.'

Dr. Wicksteed considered these to be fair translations.

Though they have often been quoted, part of their significance seems to have been missed; in the first place the Italian 'tin tin sonando' is clearly imitative, inevitably suggesting a small high-pitched bell, and therefore, a comparatively small chamber-clock.   The 'spouse of God' is the Church which is called by the horologe to sing her *matins* (mattinar) to her spouse, i. e. to God.   The second quotation appears to refer to the striking mechanism and is, at any rate, descriptive of the extremes of motion in a train of wheels.

In view of all this it seems likely that the primary object of the earliest clocks was to awaken the sacristan for Matins, by a blow or a series of blows on a bell. Machines for delivering a rapid succession of blows to a bell are depicted in manuscripts, and though they were perhaps operated by hand, it is possible that similar devices, set in motion by a going train, constituted these early 'alarums'. It is even possible that the first application of a weight was for setting them in motion, and that the 'going' or timing part was at the same time a clepsydra arranged to operate a release.   In any case the critical point in the history of Horology was not the introduction of the weight-drive but the invention of the oscillatory mechanical escapement.

One of these MS. drawings from the sketch-book of Wilars de Honecort, the French architect, *c.* 1250, represents an arrangement of four men, each in the act of driving a nail into the foot of the man in front.   The right arms were probably pivoted, and the whole was designed to rotate so that the hammers successively struck a bell.   According to Lassus and Willis, somewhat similar hand-operated mechanical bell-ringers exist in certain foreign churches.   Another drawing, which is not very easy to interpret, is in MS. *Delineationes Machinarum* (xv cent.) Harl. 328, f. 71 rev.   The earliest known genuine escapement is the foliot-balance, though a drawing in Wilars de Honecort's book

has been cited as representing an earlier escapement device, depending upon the alternate slip and grip of a system of ropes; the claim does not seem satisfactory.

The foliot-balance is dealt with fully in encyclopaedias and horological books, and must therefore be described in the fewest possible words, which will be more comprehensible if reference is made to the illustrations of the Dover Castle and 'Webster' clocks (pls. XLV and XLVIII, figs. 1, 2).

A vertical spindle, rotating in bearings and generally hung by a thread, the notched support for which surmounts the clock as seen in the illustrations, carries a cross-bar capable of turning in a horizontal plane. The moment of inertia or 'fly-wheel effect' of the rotating bar is increased and regulated by weights hung on either side of the centre, these weights being attached to pierced saddles that drop into notches on the bar exactly as in the case of an ordinary weighing machine or steelyard. The further the weights are removed from the centre the greater is the fly-wheel effect and the slower is the period of swing. The spindle carries two pallets disposed one above the other so as to engage diametrically opposite points on the circumference of a crown-wheel revolving in a vertical plane. The rotational effort imparted to this wheel from the driving-weight through the wheel-train acts on one pallet, causing rotation of the balance until the tooth slips past the pallet; then the diametrically opposite tooth engages the other pallet and reverses the rotation of the balance. The balance has a resulting motion resembling that of a modern watch balance-wheel, but of course, with a much longer period of swing. It is easy to show why this arrangement gives very irregular oscillation and bad timing, and it was soon discarded on the introduction of the pendulum in the seventeenth century.

Very few original examples remain among really ancient clocks, though balance-wheels without adjustable weights occur frequently in sixteenth-century chamber-clocks. The Japanese adopted the foliot-balance and employed it without change in finely manufactured iron movements during the seventeenth, eighteenth, and early nineteenth centuries and perhaps earlier. The cross-bar with its weight has for long been known as a 'foliot', and the escapement is a form of what is called a 'verge'. The word 'foliot', strangely enough, receives no notice as a horological term in *The Oxford English Dictionary*, except as an old French word meaning a watch-spring, a use which is surely of late date, but it is stated that Hatz Darm derives it from the verb *folier*, to play the fool, to dance about, and the erratic oscillation of these early balances may have been the origin of their name.

In small clocks attempts were made to give greater precision to the old non-adjustable wheel-balances by adding springs, but it was commoner by far

to remove the balance and the crown-wheel, substituting a horizontal crown-wheel and a pendulum. The majority of ancient clocks, whether of the 'turret' or church type, or of the smaller domestic kind, have been thus altered or adapted.

The first development from the 'alarum' type of machine would naturally be a device for striking a bell at all the canonical hours of the day, and the next would be the division of the day into twenty-four parts, and attempts to construct a mechanism for signalizing each of the hours so obtained. This phase may mark a most important moment in the history of Horology, for Mr. Baillie quotes Bilfinger, *Die Mittelältereichen Horen und die Modernen Stunden*, who finds that the change from the reckoning of events in terms of canonical hours, the universal method in all early fourteenth-century chronicles, to their expression in numbered hours in any given place was almost invariably contemporaneous with the appearance of a fully developed clock. Mr. Baillie, who holds that the clocks which made this possible either replaced clepsydrae or were the first kind of horologe to be used in the locality, mentions St. Albans, where all chroniclers deal in canonical hours until 1394, the date of Abbot de la Mare's completion of a clock there (see pp. 269, 271). His arguments are fully developed in his book on 'Watches'.

JACKS AND AUTOMATA

The use of mechanical figures or 'jacks' for striking bells probably followed as a diverting conceit and doubtless caused even greater delight and amusement in the middle ages than it does in these days of electrical shop-window mannequins. The division of the hour into quarters, probably a still later device, was naturally accompanied by the provision of quarter-chiming mechanism commonly arranged to strike two notes, the first being of the higher pitch. It was natural to make pairs of figures called quarter-jacks to perform this service and it is noteworthy that, in this country at least, they are uncommon until a late period.

It is said that the French word *Jacquemart*, which still survives as a French surname, has been derived from *Jaccomarchiadus*, a man in a suit of armour, but our English word 'jack' has evolved from a bye-name or familiar equivalent of 'John' to its subsequent use for an appliance that mechanically does a man's work, e.g. a spit-jack or a screw-jack, and we now see it transformed into a verb when a motorist 'jacks up' his car. Apparently the earliest known English use of the word is that quoted in *The Oxford English Dictionary*, (from Kerry *Hist. Ch. of St. Laurence, Reading*, 1883), 1498–9 'It. payed for the settyng of Jak with the hangyng of his bell and mendyng his hond, iiij d.'

Interesting references of late date are as follows :—

Decker (speaking of St. Paul's Jacks in 1609) : 'The great dial is your last monument ; where bestow some half of the three-score minutes to observe the sauciness of the Jacks that are above the Man in the Moon ; the strangeness of their motion will quit your labour.'

SHAKESPEARE, *Richard II*, Act v, Sc. v, l. 59 :

    K. Rich.   'but my time
            Runs posting on in Bolingbroke's proud joy,
            While I stand fooling here, his Jack o' the clock.'

Richard III, Act iv, Sc. ii, l. 113 :

    K. Rich. 'Because that, like a Jack, thou keep'st the stroke
                Betwixt thy begging and my meditation.'

EDWARD SHARPHAM, *The Fleire*, 'As it hath beene often played in the Blacke-Fryers by the Children of the Reuells.' 1607 (p. 109, D₂). *Fleire.* 'But alas Madam, I doe not beleeue them, because I knowe the conditions of the slaues ; whie Ile tell you, their tongues are like the Iacke of a Clocke, still in labour.'

We may suppose that the use of jacks for the purpose of striking bells was followed by the increasingly elaborate processions and shows which were so much commoner on the Continent than in England, where a pleasant restraint is shown.   Indeed, no important early native clock remaining here is embellished with a religious or humorous puppet-show having no useful function to perform except that at Wells, where the little charging horsemen are so delightful and naïve as to disarm all criticism.

The method of operation varies widely, but there is nearly always provision of some flexible element to insure the slight return action necessary to free the striker from contact with the bell after delivery of the stroke.   The exterior jacks at Wells turn bodily about vertical spindles ; the small men (*circa* 1500) exhibited by me at the meeting of the Society held on 4th November 1926 not only turn bodily about their centres but progress round the bell at the same time. 'Jack Smite-the-Clock' at Southwold, the Blythburgh man, the little huntsman at Minehead, the quaint little seventeenth-century jacks at Norwich, the giants at St. Dunstan's, Regent's Park, the early nineteenth-century soldier at Wimborne, the two minor figures at St. Mary Steps, Exeter, and the top-hatted man at Hagley Hall, all strike through the motion of one arm, generally the right arm, pivoted at the shoulder.   But the figures at Southwold, Blythburgh, and Wells also turn their heads, while Jack Blandifer has the additional accomplishment of kicking quarter-bells with his heels and is provided with a hammer in each hand, one only of these hammers being at present (at any rate) in use. At St. Mary Steps the seated figure of Henry VIII bows at the hour.   At Avignon the jack (*c.* 1600 ?) is divided at the waist and his upper part turns.

At Christ Church, Bristol, the eighteenth-century figures in classic armour are made so that their short skirts are roughly circular about a vertical axis and they are divided horizontally in the thighs, the upper part being arranged to turn.

A delightful foreign example at Jena is here reproduced through the kindness of Dr. Paul Weber, University Professor and Director of State Museums in that city (pl. XLVI), to whom I am also grateful for many details. It is described and illustrated in Lacroix and elsewhere, but as the descriptions are faulty, the following facts are worth recording. A grim and magnificently carved wooden head is supposed to represent the buffoon of the Grand Duke Ernst, Elector of Saxony, who died in 1486; Lacroix wrongly describes it as of bronze. This head, known as the *Schnapphans*, has wires passing through the cheeks so as to operate the jaw, and when the hour is about to strike a pilgrim offers to the mouth a golden ball at the end of a staff and the jaw opens and closes. The ball is described by Lacroix as an apple, but Dr. Weber says that the staff and ball, and a crudely renewed right arm were provided for the pilgrim in the middle of the eighteenth century and that at an earlier date the object offered may have been different.

An angel standing on the other side of the Schnapphans does not hold a book as in the illustration given by Lacroix, but a small bell that hangs from a cross-bar.

Jacks and automata connected with clocks have a peculiar fascination for old and young alike, as may be judged from the waiting crowds in the transept at Wells. It is delightful therefore to find the tradition renewed at Liberty's in the beautiful St. George and the Dragon designed by our Fellow Mr. Kruger Gray, and carried out electro-mechanically by Mr. F. Hope-Jones and his assistant Mr. J. C. S. Davies.

THE FUNCTIONS OF THE HOROLOGE FROM EARLIEST TIMES

The following notes may throw some light on the chronological sequence of the functions performed by horologes.

1. The origin of the word 'clock' is, of course, discussed at length in *The Oxford English Dictionary*, the essential points being that it goes back only to the thirteenth or fourteenth century in Mid. Dutch *clocke* or ONF. *cloke, cloque* = Central Fr. *cloche*, a bell. It is probably echoic, imitating the rattling made by handbells of sheet iron and quadrilateral in form. For the original and general sense of the word in other languages, i.e. a bell, the English had the word 'bell' in regular use, and it is probable that clock was introduced either with striking clocks or at least with bells on which the hours were mechanically struck. It
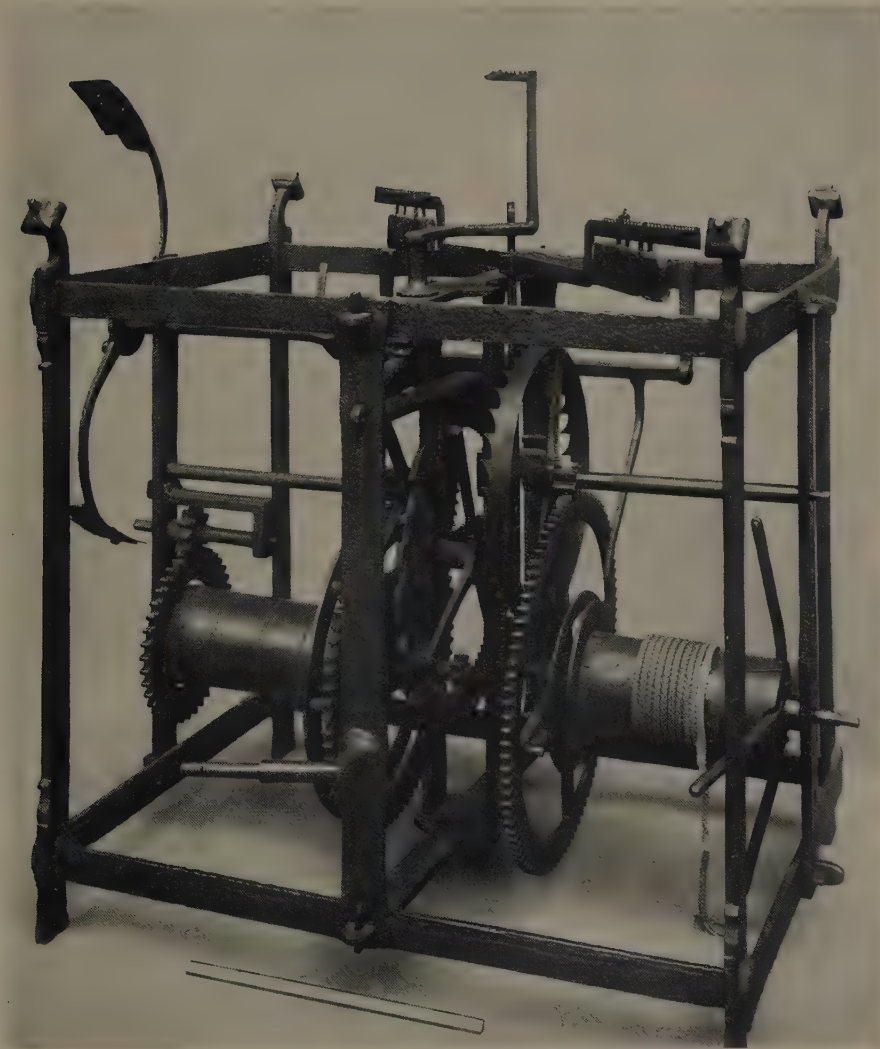
Early Clock movement from Dover Castle

By permission of the Authorities of the Science Museum

Fig. 3. Jena: the Pilgrim

Fig. 2. Jena: the Angel

By permission of Dr. Paul Weber

Fig. 1. Jena: the Schnapphans

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was never prevalent in ME. in the mere sense 'bell' and is not known in England until 1371 (see p. 274).

2. The English horological trade still distinguishes between the 'clock' that strikes and the 'timepiece' that measures time on a dial and does not strike.

3. Several ancient clocks strike only, having never had dials. One such is at Peterborough, and I am told that others exist at Norton St. Philip (Mr. E. H. Horstmann) and at Louth (Mr. J. McDowell). Southwold parish church provides an interesting example, for there is a fine jack of the fifteenth century which we may suppose was installed with a clock by that same John Payn of Southwold who did clock work at Walberswick near by in 1495. However that may be, the only clock remaining at Southwold is a rusty wreck in the tower, bearing the initials I. W., B. R., I. T., and R. S., and the date 1708. This mechanism is only designed for striking the hour and never had a dial. We must presume that had a dial existed for its medieval predecessor, it would not have been abandoned in 1708, and it is therefore likely that the original clock merely operated the present jack and like the later clock had no dial.

4. In Wilars de Honecort's note-book is a drawing of an ornamental clock-house, apparently of wood and for interior use. There is no round opening nor any suggestion of a dial, and though there is nothing conclusive about this it may mean that he had in mind merely a bell-ringing clock, or it may have been designed to house a clepsydra.

Following upon quarter-striking mechanism came the addition of quarter-hour dials and, late in the seventeenth century, minute-dials.

Having sketched the probable order of development of clocks with reference to their *performance*, we may proceed to deal with the important question of the exact *nature* of the earliest horologes. Accepting Dante's references as the earliest satisfactory evidence of clocks, and taking the date 1300 to 1320 as a starting-point, and Italy as the probable birthplace of clocks, there appears a public clock at Milan in 1335. From that point Mr. G. H. Baillie quotes an astonishing list of twenty-nine public clocks and shows that, broadly speaking, they exhibit progressional tendency across Europe, appearing most in Italy at first, between 1336 and 1359, in Germany between 1352 and 1369, in the Nether-lands between 1362 and 1375, and in France, first at Paris in 1371. In this list there is, of course, overlapping, but the dates and places indicate a broad tendency. In considering whether we are to accept the theory that clepsydrae were the only precursors of these public erections, which must have been clocks, it is necessary to discuss the matter in special relation to records in this country, but we may first review Mr. Baillie's arguments on the general question. He says that there is no doubt that water-clocks existed in monasteries, though he knows of no existing remains; he has seen a picture of an elaborate architectural

case for a clepsydra and believes that clepsydrae grew steadily in magnitude and importance throughout the earlier middle ages, and until the coming of the clock. This idea of high development is, of course, reasonable if the main theory as to the late arrival of escapement-clocks be accepted ; indeed, it is essential for explaining the magnificent horologes described in records.

Several clepsydrae are recorded in the Classic period, but Mr. Percy Webster inclines to the view that they subsequently fell out of use until the seventeenth century when well-known examples appear and are to be seen in various collections. He points out that none of an earlier date is in existence, and that water-clocks are, in any case, liable to trouble from freezing. Mr. Baillie gives me an unquestionable reference to clepsydrae from Cassiodorus, fifth and sixth century A.D., and quotes a clear case from Hildemar's Benedictine Rule of the ninth century; he considers that the famous horologe of the Cistercian Rule of 1120 is likely to have been similar, and also gives me, from *Chronicon Melli-cense*, twelfth century:—'A brother who shall have a clock, shall wake the others', which proves the early existence of some kind of horologe small enough to be possessed by an individual in a monastery. Finally, he cites the case of the Abbey of Villers where there remains a slate bearing inscriptions relating to the abbey water-clock. He maintains that all recorded horologes on the Continent previous to the dates in his list (beginning with Milan in 1335) were clepsydrae, and that if we accept as escapement-clocks the remarkable English group which (so far as I know at present) began in 1284 we are claiming a state of development in England that was far ahead of anything reached abroad. The St. Paul's clock certainly supports such a claim and, unless the clepsydra theory does at last undergo considerable modification in its general application to all European horologes, this clock must surely be a challenge to it. The clock at Milan, which heads Mr. Baillie's list, is of high interest, for he tells me that a contemporary document describes it as giving one stroke for one o'clock, two strokes for two o'clock, and so on for all the hours, and claims it as a new and important benefit to mankind.

CLOCKS IN ENGLAND

Mr. G. H. Baillie holds the view that no clocks were known in England until nearly 1368, and as almost the whole of existing literature of the subject would be largely falsified if such a view could be upheld, the idea must prove as great a shock to many as it did to the present writer, whose faith was severely shaken in the course of his own inquiries into the real dates of existing English remains. Among all those clocks that had been so affectionately regarded as belonging to pleasantly early dates in the fourteenth century and as associated with such names as Lightfoot and Grandisson, not one could be regarded as certainly, or

even probably, retaining a fragment of work earlier than 1392; while the four most important west country examples had definitely to be excluded from any earlier period. Even so the contention that previous records all refer to clepsydrae, even where an old clock now remains as a successor, aroused a desire to seek and verify all available evidence before giving up existing ideas.

Mr. Baillie considers that the appearance of clocks in England coincides with the invitation of Edward III in 1368 to three Dutch *orologiers* of Delft to come 'in regnum nostrum'. He quotes a monk of Malmesbury who writes in 1373 *Hoc anno horologia distinguentia xxiv horas primo inventa sunt*. He does not use this as proof that 1373 is the true date of the introduction of clocks in England, but as showing that a west country monk who would hardly be ignorant of such important appliances as we have believed existed in the neighbourhood regarded them as a novelty.

Numerous records of horologes occur before this date, but all attempts to glean information as to their nature have so far been baffled. We may be sure that the existence of a keeper excludes the sundial, but we cannot say that a water-clock needs no keeper. There are no references to weights or to bells operated by the horologes, and it is at least remarkable that the importation of the Dutchmen is practically coincident with the first appearance of the word 'clock'. It will be strange, indeed, if this obscurity remains indefinitely, and it is probable that a careful search of records in all places where the existence of an early horologe is known or suspected, would dispose of many difficulties. When making such search as was possible in the limited time at my disposal I was struck by a sudden efflorescence of records at the close of the thirteenth century, and on the same platform where, during the Wallingford Commemoration ceremonies at St. Albans, I drew attention to this, an additional record was mentioned by Prof. H. W. Garrod, of Merton College, Oxford. If the reputed Westminster horologe of 1298 be admitted there are five in a period of fourteen years, after which Norwich, the next in the list, follows with an interval of twenty-four years. In all cases the term employed is some variant of *horologium* and, wherever there is no evidence as to the nature of the appliance, the term 'horologe' will, as stated above, be used. The gap of twenty-four years is possibly without significance, but whether or no we consider as one group all between 1284 and *circa* 1330, the last twenty years of the thirteenth century seem to have brought some new invention or a sudden fashion for the erection of a known device; we might even infer from the size, or sumptuous nature of some of the horologes and from the evident pride of the St. Albans chronicler, that the usual rivalry between great abbeys and cathedrals was extended to the erection of horologes.

The references, in chronological order, are as follows:

1. EXETER. 1284. Grant of a tenement to Roger de Ropford, the bell-founder (*campanistario*), and others for performing certain duties including the repair of *organa* and *orologium*. See account of the Exeter clock below.

2. LONDON. ST. PAUL'S. 1286 and 1344. The following extracts are from the *Domesday of St. Paul's* (Camden Society, no. 69, p. 172).

(*a*) 1286. COMPOTUS BRACINI SANCTI PAULI A FESTO SANCTI MICHAELIS ANNO GRATIAE MILLESIMO CCLXXXVI USQUE AD IDEM FESTUM ANNO SEQUENTI. Items in the above account are:

Item. Bartholomo Orologiario per tria quarteria anni et VIII dies .cciiij[xx]*.i. panes . . .*

After numerous other charges comes:

Item. Bartholom' orologi' post adventum Willielmi de Pikewell xxiii bollae.

(*b*) 1344. CART. COTTON XXI. 24, IN THE BRITISH MUSEUM. This beautifully written Norman-French indenture has had five seals attached, but one only remains. I give most of the text as it has been badly misrepresented.

' *Ceste endenture tesmoigne qe conuenuz est parentre le Dean et le Chapitre de leglise de Seint Pool de Londres dune part et Wauter Lorgoner de Suthwerk dautre part. Cestassauer qe le dit Wauter ferra une dyal en lorloge de mesme leglise od roofs et totes maneres de vstimentz appartenantz al dit Dyal, et au tourner del Angel par amunt lorloge issint qe le dit Orloge soit bon et couenable et profitable a moustrer les houres de iour et de nuyt, a durer sauntz defaute, et en cas qe defaute soit troue apres ces houres en le dit Orloge, le dit Wauter se oblige par ceste endenture de faire les adresces totefoiz quant il serra garni par les ministres de leglise . . . Et le dit Wauter trouera a ses coustages ferre arresme et tote manere dautres choses a la dit ouereyne parfayre et auera devere luy veuz vstimentz qui ne volunt plus seruir . . . Done a Loundres Le Samadi Le iour de Seint Edmund le roi et martire lan du regne le Roi Edward tierz del conquest Dyssuitime.*'

3. OXFORD, MERTON COLLEGE. 1288. I am indebted to Professor H. W. Garrod for his kindness in providing the following references found by him when searching for any allusions to Abbot Wallingford in the Merton records:

1288. No. 4053 records the payment of 4*s.* 4*d. ad opus horologii.*

1327. No. 4078 records the removal of the horologium from the Hall.

1387. No. 3716 *Item in expensis factis circa horologium : in cordis iiij d. : item fabro pro ferrament' xviij d. : item dat' eidem in cervisia j d. Item in vino dato artifici per vices, xij d. ; et tantum in vino, quia nihil aliud voluit capere pro opere.*

4. CANTERBURY, CHRISTCHURCH CATHEDRAL. 1292. In the list of Prior Henry of Eastry's Works in Register I, fo. 212 [Cant. MSS.]

Anno 1292. *Novum Orologium Magnum in Ecclesia* xxx*l.*

5. WESTMINSTER PALACE. 1288? There is a tradition that in the sixteenth or seventeenth year of Edward I (*c.* 1288) the Lord Chief Justice Randulphus de

Hengham, having made an alteration in a record, was fined eight hundred marks by the king's order, and the money was applied to defray the cost of erecting a public clock opposite the entrance to Westminster Hall (Britton, p. 23). This is unsatisfactory, and is only quoted in case it should elicit further facts relating to this period (see p. 273).

6. NORWICH CATHEDRAL. 1322–5. C. H. B. Quennell says in *The Cathedral Church of Norwich* (Bell's Cathedral Series): 'There are records in the sacrist's rolls of materials used in the construction of an earlier clock that was made between 1322–25 of two hundred pieces of Caen stone, and ten of "Gobetz" used to make a base, and that for making thirty images to represent the days of the month, no less than 47s. 4d. was paid.'

7. GLASTONBURY ABBEY. 1323–34. John of Glaston, whose chronicle closes in 1493, says that Abbot Adam of Sodbury (1323–34) made a *Magnum horologium processionibus & spectaculis insignitum*. See account of Wells below (p. 288).

8. ST. ALBANS, ABBEY. 1326–35 (Abbot Wallingford) and 1349–96 (Abbot de la Mare). *Chronica Monasterii S. Albani. Gesta Abbatum.*

(a) *Inter quae* [*libros et instrumenta de Astronomia et Geometria*] *praecipuum instrumentum astronomiae antea invisum ' Albion' quasi totum per unum, etymologice vocitavit.*
(b) *' Fecit quoque et illud nobile opus horologii in ecclesia, magnis sumptibus et industria.'.*
(c) 1349–96. ABBACY OF DE LA MARE, *Gesta Abbatum.*
' Hujus etiam Abbatis sumptibus et industria, artificio Magistri Laurentii de Stokes, horologiarii praecipui, et cujusdam sui commonachi, Willelmi Walsham vocitati, qui pene in opere manuali et sculpendi subtilitate cunctos regionis artifices superaverant, superius diale et rota fortunae, per Abbatem Ricardum, eorum omnium magistrum, primitus dispositum, sed sua cita morte et aliis expensis urgentioribus interim omissum, nobiliter sunt perfecta. Cujus sumptus, propter operis magnitudinem et subtilitatem, ad centum marcas et amplius sunt aestimati.'

ANALYSIS OF EARLIER ENGLISH REFERENCES

1. The bell-founder at Exeter who had to make bells and repair the organs and horologe was apparently a general craftsman and metal-worker and there is nothing in the Patent that throws light upon the nature of the horologe. The Patent has special interest if, as I think is the case up to date, it contains the earliest English record of a horologe yet brought to light. It also has, of course, a special local interest in view of its previous misinterpretation.

2. (a) Here at St. Paul's we have, in 1286, apparently the first mention of an *orologius* or *orologiarius*—a professional clockmaker, though more than half a century later horological work is done for the same building by an *orgoner*. The William of Pikewell who came a little later was probably an assistant.

(*b*) In this agreement of 1344 between the Dean and Chapter of St. Paul's and Walter the orgoner of Southwark, the said Walter is to make a dial in the horologe with roofs and all kinds of housing appertaining to the said dial, and to the turning of the angel on the top of the horologe so that the said horologe shall be good, fitting and profitable, to show the hours of the day and of the night, to endure without failing. In case of failure after the present time, the indenture binds Walter to set the matter to rights when summoned by the ministers of the church. He is to receive six pounds sterling on completion of the work, is to find at his own cost the iron and brass, etc., and is to have for himself the old apparatus which will no longer serve.

The above probably represents fairly the sense of the indenture, and there seems no justification for some of the following inferences given by Dugdale in his *History of St. Paul's* and repeated industriously during a century. 'Somewhat above the stonework of the steeple was a fine dial, for which there was order taken in the 18th Ed. III that it should be made with all splendour, which was accordingly performed, having the image of an angel pointing to the hours, both of the day and night.' A modern writer adds that there was, prior to 1298, a clock at St. Paul's with jacks, and that the dial was placed below them. There is nothing to indicate the position; there is nothing about the splendour, and the angel is not said to point out the hours. The existence of jacks in 1298 is most unlikely, and the story probably arises from the above reference to the position of the angel. The document is, however, of utmost importance. Here, in 1344, is a horologe, apparently with an automaton and a dial indicating hours. It requires housing and a roof, though we must not hastily assume that it was an exterior public clock, as the clock-house in Wilars de Honecort's MS. is apparently an erection of wood for interior use with what one might call a toy, or model, tiled roof. Nevertheless, it is hard to believe that this is not a genuine and most interesting instance of a public clock, and almost equally difficult to accept it as a mere clepsydra. It has been suggested that 'angel' should be *augel* and is corrupted from *aiguille* and that the word 'roofs' should be *roos* (wheels), but the charter has been examined carefully and the words are as printed here. The indenture is carefully and well written, and it would be strange if two such vital words were the only important mistakes. The use of brass is interesting, and the removal by Walter of the old apparatus, together with the reference to the 'angel' as if it already existed and to the 'dyal' as if it were new or to be renewed, leave the nature of the previous horologe very doubtful. The making of a dial *in* the horologe is curious.

3. The two early Merton references show that the horologe was an interior one, but they give no help as to its nature. The 1387 entry apparently refers to a clock, but is subsequent to the date at which clocks were admittedly familiar.

4. In the case of this 'great' horologe at Canterbury we must decide whether anything in the nature of a clepsydra is likely to be so described.

5. Apart from the somewhat unsatisfactory nature of the Westminster tradition, there is little here for comment except in the statement that this was a public clock, which rather detracts from the already doubtful value of the whole story. Other important and interesting matter relating to a later clock here is quoted under the heading 'The Westminster Clock-Tower'.

6. In the case of Norwich it is somewhat difficult to believe that so elaborate an architectural scheme was carried out for a clepsydra, and it would be important and interesting if we knew whether the thirty images to represent the days of the month were merely stationary, or were automata, having individual or processional action.

7. (*a*) The Glastonbury reference, apparently the sole justification for the whole Lightfoot legend, has no special intrinsic value, and at so late a date may perhaps be of inferior importance, in spite of all that has been deduced from it. (*b*) The clock with processions and spectacles described by John of Glaston, and hitherto assumed to bear reference to Lightfoot's clock, is likely to have been a fifteenth-century renewal; there is certainly no real reason for identifying (*a*) and (*b*).

8. (*a*) Abbot Wallingford's 'Albion', often identified with his horologe, was probably an astronomical instrument. (*b*) 'The noble work the horologe' made by Wallingford at St. Albans is described as vaguely as those in other references. (*c*) Here we are definitely told that the upper dial and wheel of fortune *were completed, having been originally set up through the agency of Abbot Richard*, but delayed on account of his untimely death, and other more pressing expenses. *On account of the size and intricacy of the work, the costs were estimated at more than 100 marks.*

Mr. Baillie points out that canonical hours gave place to the twenty-four-hour reckoning in St. Albans manuscripts exactly at the period of de la Mare's abbacy, and seems inclined to think this a proof that the Abbot made the first twenty-four-hour clock possessed by St. Albans *de novo*, and thus brought about the change. It may be that in completing Wallingford's clock, he introduced a twenty-four-hour dial that was never contemplated by Wallingford, but can we accept the view that the chronicler would speak so plainly of his completing an unfinished work, if that work were a clepsydra, and the finished appliance a clock? Unless it is possible to accept my suggestion that there may have been an intermediate stage between water and weight-driven clocks, it seems far-fetched to suppose that de la Mare would attempt to convert a water-clock into one driven 'by peise', even if we admit that an appliance having a dial and a Wheel of Fortune (possibly an automaton) is likely to have been water-driven.

The value of the St. Albans MS. is high because the *Gesta Abbatum* is a running chronicle, each part of which is contemporary with what it describes. The analysis of this group of records seems to me to favour the theory that some, at least, of the horologes were clocks. Further, if we adopt the belief that clocks did not appear in England before 1368, we must presume their development to have been extremely rapid or, alternatively, must judge that they were most highly developed on the Continent, and that the knowledge of them, as complete and elaborate arrangements, spread with remarkable rapidity considering medieval conditions. We must also account for so highly developed and finely conceived a work as that at Wells being completed within twenty-two years and for the familiarity with which the Welsh poet Dafydd ap Gwilym wrote of an elaborate and fanciful clock having a *pair of ropes* within, at most, thirty-two years. He flourished 1343–1400, but the passage may, of course, have been written long before his death.

'Confusion to the black faced clock by the side of the bank that awoke me. May its head, its tongue, its pair of ropes, and its wheels moulder, likewise its weights of dullard balls, its orifices, its hammer, its ducks quacking as if anticipating day, and its ever restless works! This turbulent clock clacks ridiculous sounds like to a drunken cobbler, a cobbler too, in appearance. Cunning and false blindgut! the yelping of a dog in a pan echoed! the ceaseless clatter of a cloister!—a gloomy mill grinding away the night!'

His epithet 'false blindgut', as given in Captain Smyth's translation (*Archaeologia*, vol. xxxiv, p. 5), might seem to be a criticism of its time-keeping! The word 'orifices' is curious. If an accurate rendering, it would suggest a mechanism operated hydraulically in part, but no definite inference can be drawn. It is interesting to consider together the crude and dubious mechanism sketched by Wilars de Honecort in the thirteenth century, for making a figure of an angel point to the sun, the turning angel on top of St. Paul's horologe, and the Wheel of Fortune at St. Albans. The first two, in especial, may be connected by some hitherto undiscovered link, but the recent claim that Wilars describes an escapement is unconvincing. Britton gives interesting references to an *auloge* made in 1360, for King John of France in England, but its nature does not appear.

THE PERIOD OF CERTAINTY IN ENGLAND AND THE APPEARANCE OF THE WORD 'CLOCK'

In 1368, Edward III invited *Johannem Vrieman, Willielmum Vrieman et Johannem Lietuyt de Delft, orologiers, veniendo in regnum nostrum.* They received a patent for safe conduct.[1]

[1] See Rymer's *Foedera*, Holmes ed., vol. vi, p. 590.
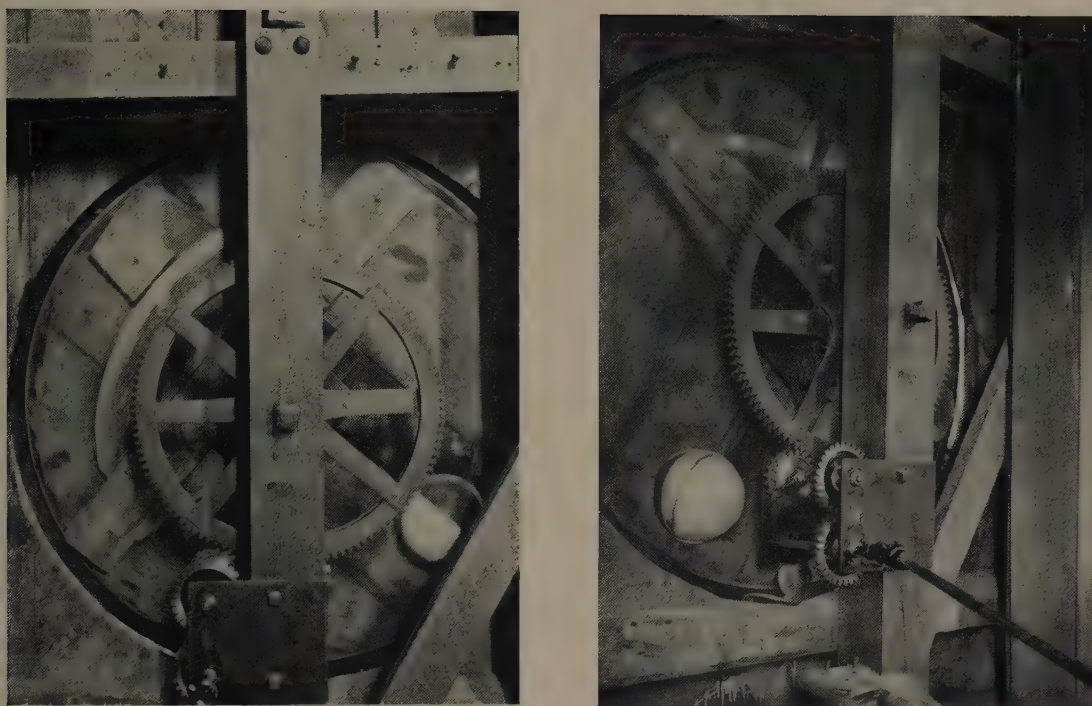
Fig. 1. Ottery St. Mary : Lunation mechanism behind dial

a *b* *c* *d*

Fig. 2. Framework finials
a, Dover ; *b* and *c*, Cambridge ; *d*, Rye
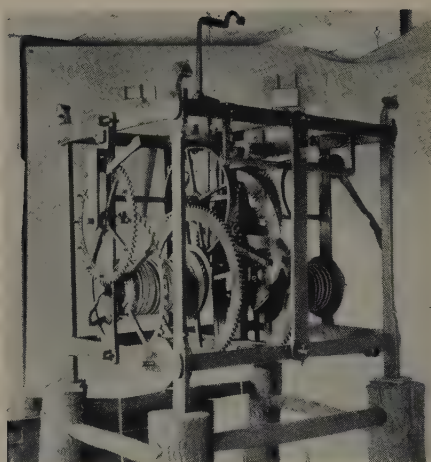
Fig. 1. Mr. Percy Webster's clock from
Cassiobury Park
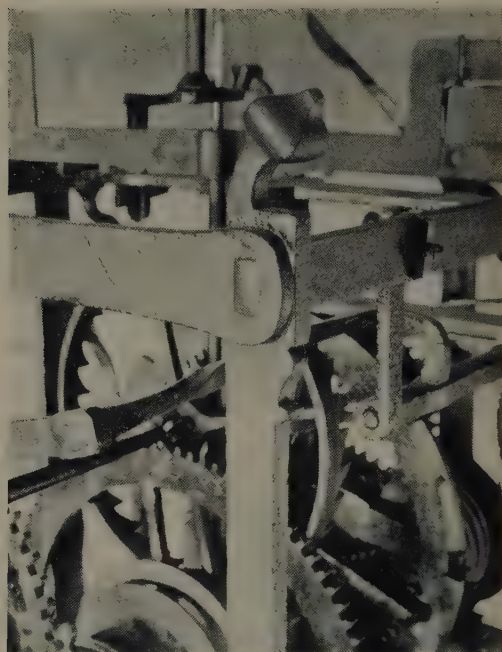
Fig. 2. Notched standard for supporting thread
of balance; Mr. Webster's clock

Fig. 3. Corner standard, with moulding
and finial; Mr. Webster's clock
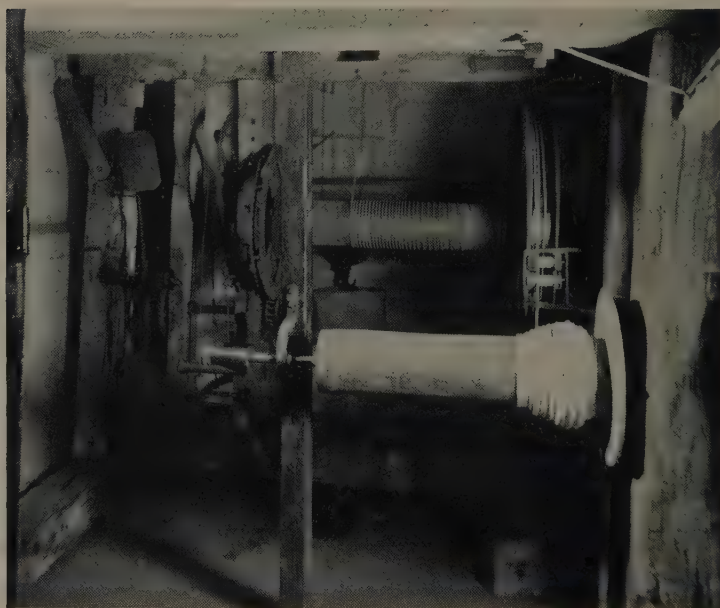
Fig. 4. Peterborough Cathedral: clock movement

Photograph by Mr. H. Plowman

Before that date it seems vain to search for the word 'clock', but soon afterwards it became commoner, though the various forms of *horologium* remained in use until a late date.

At the same time, the post of clock-keeper assumed importance, and entries for repairs began to show items clearly relating to weight-driven clocks.

THE WESTMINSTER CLOCK-TOWER

There is one important and most interesting document which is three years earlier than the arrival of the Dutchmen, but is included in the 'Period of Certainty', because there is some reason in the contention that the clock-tower to which it relates was erected by the king in preparation for a clock already contemplated, or in actual process of construction. Moreover, Mr. Baillie does not assert that clocks were entirely unknown in England until 1368, but that they appeared very close to that date, the coming of the Dutchmen being part symptom and part cause.

A Roll described by Brayley and Britton, *History of the Ancient Palace of Westminster*, as in the King's Remembrancer's office and entitled 'Particulae Compoti', etc., is now in the Exchequer Accounts, bundle 472, no. 14, 39 and 40 Edward III. It contains particulars of the Account of William de Sleford, clerk and superintendent of the King's Works at his Palace of Westminster, of all receipts, disbursements, and expenses of the said William from the 28th of September, in the 39th year, to the 27th of September ensuing, being for one whole year. The document is of great interest as a record of technical terms and prices in building construction, and a translation is given by Brayley and Britton. I have examined the roll, and have inserted in each case the exact form used for the word *horologium*.

To John Wytcliff for 22 *dol.* (cask-fuls) of Bere-stone (with freightage), bought *pro tabulamentis et gargol*, of the New Tower at the end of the king's garden and for the en-tablature of a tower *pro quod' orlog̃* within the palace (i. e. presumably within the precincts) at 8*s.* 6*d.* per *dol.*, 11£ 1*s.*

To William Cretyng (misquoted as Gretyng by Brayley and Britton), Simon atte Hall, Maurice Yong, and William atte Barr for 8107½ feet of stone called ashlar, bought at Maidstone for the aforesaid *turr̃ et orlog̃* (misquoted as 'dial-tower' by B. and B.) etc. price 3*d.* per foot, 101£ 6*s.* 10½*d.*

To William Cretyng for fifty corbels of Maidstone stone for the aforesaid '*turr̃ orlog̃*' at 11*d.*, 2£ 5*s.* 1*d.*

To John Goshenne and John Wylteshire for eight boat-loads of chalk for the said *turr̃ orlog̃* at 9*s.* per load, 3£ 12*s.*

These extracts represent only a small fraction of the vast expenditure on what must have been a most ambitious tower. The words *turr̃ orlog̃*, un-connected by &, may possibly mean 'clock-tower'.

First Appearance of the Word 'Clock'

In *Abbreviatio Rotulorum Originalium*, printed in 1810 by command of King George III, is a slightly incorrect version of a document of 22 Edward III, the general sense of which is rendered here.

A piece of land seventy-two feet long and twenty-four feet wide, in 'Seynt Martynplace', in Gloucester, is granted to the burghers of Gloucester for the erection of a tower in which certain bells shall always sound, the hours of the day and night being indicated by a clock, vulgarly called (*clok vulgarit' nuncupata*), placed and hung in the same tower. This seems also to be the first English reference to a true public clock.

In the Orders for the Regulation of the Mason's Work, York Chapter, 1371, is the following :—

'and þai sall stande þar trewly wyrkande atte þaire werke all þe day aftyr als lang als þai may se skilfully for till wyrke yf yt be alle werkday outher elles till itte be hegh none smytyn by þe clocke.'

A further early example of the occurrence of the word will be found among the Exeter records below :—*quod vocatur clokke*.

The near coincidence of date between the coming of the Dutchmen, and the appearance of the word 'clock', with the statement in *The Oxford English Dictionary* that the word probably appeared in England either with striking-clocks, or at least, with bells on which the hours were mechanically struck, lends support to Mr. Baillie's theory.

Clock-Keepers and their Duties

The Patent Rolls subsequent to the erection of the great clock-tower at Westminster show that the keepership of 'the kings great clock' was an important or, at least, a coveted post, and as clock-keepers figure so often in records, it will interest many to refer to Froissart's rather obscure poem on clocks, in which is a good description of the keeper's duties. The translation will be found in Captain Smyth's well-known paper in *Archaeologia*, vol. xxxiv, 8.

ANALYSIS OF THE METHODS OF DATING EARLY CLOCKWORK

The examination of horological remains at any particular place is naturally divided into studies, (*a*) of the mechanism, (*b*) of the dial and astronomical representations, and (*c*) of the jacks and other figures. The three features are not often found together unrenewed, and when two or more are present, they are seldom contemporaneous. In attempts to assign approximate dates, the details of ornament, costume, and armour are naturally of paramount importance as regards dials and figures, the first of these being often the sole guide to the date

of the mechanism, a guide that has frequently been ignored by mechanicians to whom a moulding or other architectural feature does not convey the information which would be gleaned by a student of architecture. It must, however, be remembered that an ornamental feature belonging to a particular period may survive, but is unlikely to precede that period, and it is possible that survival is more persistent in ironwork of the kind under consideration than it is in the almost ceaseless evolution of architectural detail in buildings. It is worth while, at this stage, to examine the features which have been put forward as guides in dating the ironwork of clocks.

1. MATERIAL USED FOR MECHANISM. The whole of the existing work in turret clocks having any pretence to antiquity in this country, and probably elsewhere, is of iron, the presence of brass wheels, bushes, etc., being a sure sign of alteration at a late date. Mr. Percy Webster, in a letter, says that most early sixteenth-century house-clocks are of iron, but that by 1575 iron and brass were mixed. He adds that the French, Flemings, and English favoured brass, while the South Germans and Swiss were inclined to prolong what he aptly calls the 'Iron Age' of clocks. He has seen country clocks, all of iron, as late as the middle of the eighteenth century.

2. EVIDENCE OF CONVERSION FROM THE USE OF THE FOLIOT-BALANCE. Although evidence of former existence of a foliot-balance has been quoted by a recent writer in the *Horological Journal* as added proof of high antiquity, it is clear that as *all* clocks were fitted with the foliot or wheel until the middle of the seventeenth century, and many, probably, long after the introduction of the pendulum, such evidence is valueless in any early clocks. The wheel-balance was used in domestic clocks only.

3. GENERAL ARRANGEMENT OF FRAME. Most of the existing early turret clocks in England are within a rectangular frame, having main vertical standards at the four corners. Horizontal bars at the top and bottom are permanently or movably secured to these, so that the whole forms a rigid rectangular frame presenting a square or rectangular outline both in plan and in elevation. The main standards may project above and below the main framework in the form of finials and feet. Intermediate bars or straps of iron divide each face of the framework vertically, and are secured to the horizontal straps or bars by wedges or cotters in such a way that they can be easily detached, and those which cross a face that is parallel to the planes of the main wheels are drilled to provide bearings for the spindles. Intermediate bars across the top and bottom carry an upright strap or bar which divides the interior of the frame into two compartments, one containing the going mechanism, and the other the striking parts. The bar is drilled for bearing-holes to take the arbors of both portions. In the Wells movement the quarter-striking train is in one of these compart-

ments, the hour-striking wheels being accommodated in an extension on the left, but the Dover, 'Webster', and Rye clock-frames contained hour-strikingtrains in one compartment and were without quarter-striking parts, though such parts were added in the case of Rye. Quarter-striking mechanism is probably a somewhat late development, though it may be that it was an established feature by the time escapement clocks were introduced in England. At Exeter I consider that the whole of the existing going and hour-striking work has been renewed subsequently to the installation of the obviously earlier quarter-part, itself unlikely to be earlier than the fifteenth century. A frame such as that at Wimborne, made *de novo* as a whole, to contain going, striking, and quarter-chiming parts in one frame must be assigned to a late date. The highly important question of the design of corner standards is considered under the heading : 'Ornamental Detail' (numbered 13).

4. USE OF LANTERN-PINIONS (pls. XLVIII, fig. 4, XLIX, *d*, and LVI, fig. 3). Lantern-pinions, i. e. comparatively small gear-wheels made by fixing equally spaced bars of iron peripherally between two discs, like the wires of a squirrel cage, have been much talked of as sure indications of early date. A well-known German horologist has expressed the view that their presence proves a clock to be of the seventeenth century. The author has, however, photographed beautiful drawings of lantern-pinions in machinery depicted in *Delineationes Machinarum*, MS. Harl. 3281, f. 71 rev. (XV cent). They also occur in VALTURIUS, *Elenchus et index rerum militarium*, printed at VERONA, 1472, and in the sketch-books of Leonardo da Vinci. The author can find no good evidence for making the presence of lantern-pinions a proof of great antiquity, though he inclines to that view on the whole. They are used in the ancient parts of the Wells and Rye mechanisms, being generally made with eight rods between octagonal discs. They are absent at Exeter, Ottery, and Wimborne (except in the dial work). At Peterborough there are two lantern-pinions and one leaf-pinion (the ordinary small toothed wheel which is familiar in most late gearing). The Dover Castle and 'Webster' clocks have leaf-pinions throughout, and were these two clocks satisfactorily established as the earliest existing mechanisms we should be driven, either to claim an earlier date for such pinions than for lanterns, or to consider the maker to be an inventor ahead of his time, or to say that this feature is quite valueless for assigning dates. As, however, these two clocks are associated with contradiction, doubt, and mystery, they fail as reliable guides. The solution is probably to be found in wind and water-mills. Large wheels can be, and are still fitted with wooden teeth fixed radially in the circumference, so that the grain is at right angles to the tangential force of drive, but it is obvious that a pinion of small diameter could not be so made, and that if cut from one piece those teeth having the grain tangential to the circumference would instantly

shear under the driving force.   Wooden lanterns do not present this difficulty as their end discs can be made of far greater diameter than the circle of rods, and of almost any thickness; indeed, the machinery shown in fifteenth-century drawings frequently has the appearance of woodwork.   It is suggested, there-fore, that lantern-pinions were familiar from the earliest gearing in mills, and that the date of the introduction of the leaf-pinion must, for the moment, remain an open question.   An interesting, though apparently rather late movement (seventeenth century?), recently acquired by the Science Museum from the Rev. R. Grosvenor Bartelot, presents the unusual feature of iron teeth driven into the oaken winding-barrels.

5. NUMBER OF ARMS OR SPOKES IN TRAIN WHEELS.   There is a tradition that a four-armed 'cross', securing the wheel rim to the spindle, indicates an early date.   It certainly occurs in most clocks having much claim to antiquity but is perfectly valueless as a guide.   It is used throughout in Harton Town Hall clock, 1657–8, and in Clement's clock from Cambridge at South Kensington, 1671.

6. METHOD OF WELDING CROSS TO RIM.   Two methods are employed, one being to divide or fork the outer end of the spoke, and to hammer it over both sides of the rim so that this is gripped, the joint being made and welded while the iron is hot. As Mr. J. J. Hall suggests, the inner edge of the rim was probably slotted so as to lock the two parts thoroughly together.   The other method is merely to make the flat spoke project or lap over one side of the rim, the two parts being fastened by one or more rivets (pl. XLVII, fig. 1).   The first method, which is very beautifully carried out in most of the early clocks, is neat, thorough and efficient.

The great wheel of the Wells mechanism has the welded spoke spread and cut to a three-leaved ornament (see fig. 1 a).   I am inclined to attribute riveted joints to a later date, but do not consider there is reliable evidence in support of the idea.

7. SECTIONAL SHAPE OF ARBORS OR SPINDLES. These are commonly roughly octagonal except, of course, in the bearing-holes.   The exact section cannot be very important unless they are turned in a lathe instead of being hammered. This would suggest sophistication, but it must be remembered that the arbor is a part likely to be often renewed.

8. DESIGN OF LOCKING-PLATES IN STRIKE-MECHANISM.   A peculiarity at Exeter and Ottery is the use of locking-plates with internal V-notches instead of the usual external rectangular slots.   These appear in pl. LV, fig. 4, immedi-ately behind the later locking-plate just below the centre of the large fly. Mr. Webster considers that the method involves more accurate work than the usual slots and, if anything, would suggest a late date.   Mr. J. J. Hall seems to think the V-notch a sure sign of early work, though in describing the striking

gear at Exeter, he speaks of it as in some respects resembling the modern arrangement of volute or 'snail'. Apart from its peculiarity there seems no special reason for his view that its antiquity is 'beyond all doubt'.

9. The Use of Spokes for Winding Drums. It is not unnatural to assign high antiquity to this primitive method of winding by turning four projecting spokes as in the case of a capstan (pl. xlv). Some early clocks have had these interesting spokes cut off, and have been adapted for winding by a large handle-key, commonly through the intermediary action of pinion-gear. The spoke-wind is doubtless of very early origin, but although it has been persistently claimed as a sure sign of high antiquity, the claim is valueless, for the method is used at Rye, where the clock is of the late fifteenth or early sixteenth century (almost certainly the latter), and at Harton Town Hall clock (parish of Hartland), 1657–8, a movement which has been admirably illustrated in an article by Mr. Inkerman Rogers in *The Watchmaker, Jeweller, Silversmith, and Optician* for January 1927.

10. Use of Spokes as Detent Ratchets. In all clocks there must be a slipping detent, such as a ratchet and pawl, which allows the barrel to rotate independently of the train during winding, but engages it with the train when the winding effort ceases and the weight or spring reverses the direction of rotation. In some early examples, notably the Dover and 'Webster' clocks, the spokes of the great wheel form the ratchet, and the spring detent, represented in late clocks by a pawl, engages with them. As there are four spokes the winding effort may have to be eased back for a full quarter of a revolution before the detent engages a spoke. In the cases mentioned the detent of the going part is a spring hoop with a step at a point diametrically opposite to the point of its attachment to the iron barrel-flange, as may be seen in the photographs. Mr. Webster suggests that this is to provide the greater strength required of the striking part.

11. Number of Wheels in Going Train. The author believes this and the considerations numbered 3, 12, and perhaps 10, to be the only purely mechanical features that can reasonably be taken as important evidence for the assignation of dates. That a carefully constructed clock should have only a great wheel and one other, does suggest a primitive stage of development, as it necessitates very frequent winding. The Dover Castle and 'Webster' clocks and the old striking gear at Peterborough are the only instances of remarkably small numbers of wheels so far as the author is aware.

12. The Presence of Screws. It was originally intended to include in this paper some notes on the history of the screw, with special reference to its use as a fastening, but not only has this interesting subject itself widened out, but the more general problems of horological history have multiplied and

become more complex, so that space does not here suffice. It is enough to say that ample and incontrovertible evidence proves the screw as a fastening to have been of rare occurrence in pre-medieval work; indeed it is so rare in medieval Europe that an exhaustive search and inquiry has not yet yielded a single convincing example earlier than the end of the fifteenth century. This is supported by important English and German authorities who have made it a subject of special research. No instance of early screws occurs in any armour or other ironwork in the Victoria and Albert Museum, the Tower Armouries, or the Wallace collection. A few months ago a writer upholding the great antiquity of certain clocks having screw-fastenings, claimed as an early screw a supposed twelfth-century threaded bolt from one of several beams in the tower of 'one of London's oldest churches'; but this claim seems quite untenable, and has since been so far modified that it does not seriously affect the case.

. 13. DESIGN OF CORNER STANDARDS AND ORNAMENTAL DETAIL. It is obvious that careful comparison of architectural ornament, with details in known architectural styles, must yield valuable results, though this aspect of early clock-making has been too much ignored by horologists whose attention has been concentrated upon mechanical detail. It cannot be too strongly emphasized that an ornament which does not appear before a certain period in architecture or in the concurrent sculpture of tabernacle, screen, stallwork, etc., cannot be accepted as of earlier date when found in a clock, but that such ornament might exist in a clock of later period than that in which it is generally prevalent elsewhere. Whilst it may be possible, for instance, to say that a certain moulding cannot be earlier than the fifteenth century, it is generally unsafe to say that the same moulding is not later than the fifteenth century merely because it ceases to be prevalent in that period.

On the whole it is likely that the detail in ironwork lagged a little behind architectural development, though such lag is not very evident in other ironwork made by the same types of craftsmen. The most important ornamental detail is usually found in the corner standards, about which there is slight conflict of opinion. Apart from details discussed in the following accounts of particular movements there are one or two considerations that are more generally applicable. It will be noticed that the Dover Castle and 'Webster' clocks (pls. XLV and XLVIII, fig. 1) have rectangular corner standards, the faces of which are parallel with the whole rectangular frame, and that the narrower edges of the standards are moulded like sections of capitals and bases. They do not definitely suggest buttresses, nor do the curiously bent-over finials suggest pinnacles. In the movements at Wells (fig. 1, and pl. L, fig. 2) and Rye (pl. LVI, fig. 3), and in the quarter-striking part at Exeter (pl. LIV, figs. 2 and 3), the corner standards are quite definitely of buttress form, which is highly accentuated in the late Gothic Rye

framework, and in all these cases the standard is set diagonally in the manner of the buttresses which bear against the corners of church towers. Here is a definite adoption of an architectural idea, and inquiry into its occurrence in English buildings elicits most suggestive facts, for in the first place early towers commonly have, at each corner, buttresses that are virtually extensions of the

WELLS CLOCK.   RYE CLOCK. N.E. Standard.
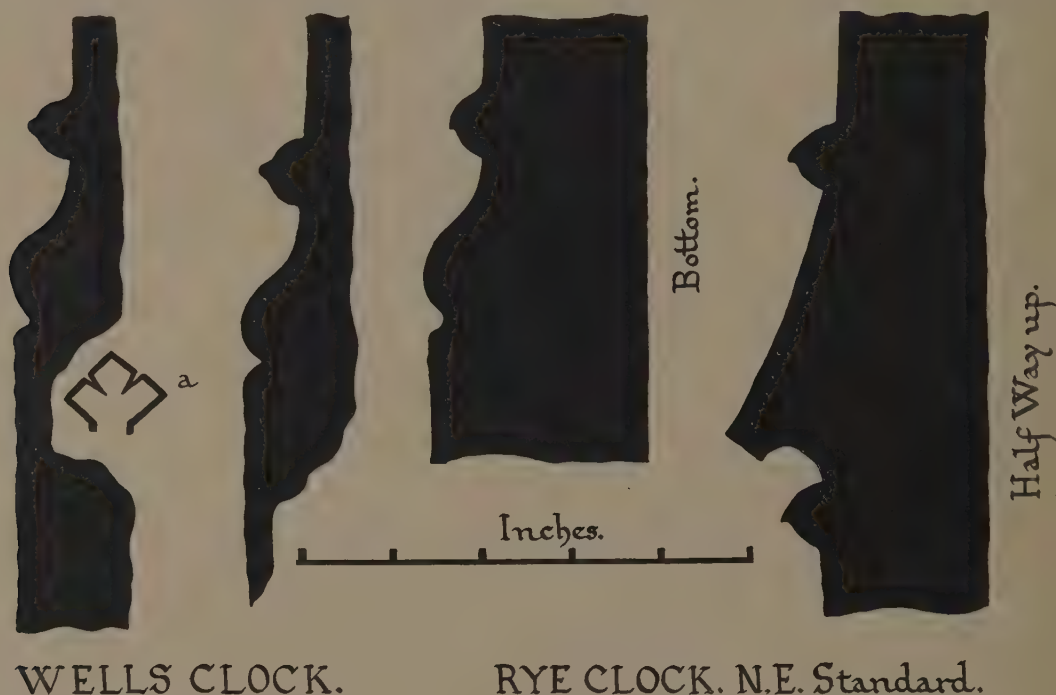
Fig. 1.   Moulding-profiles of iron standards at Wells and Rye.   a, Foliated lap of spoke-end over rim in great wheel of Wells movement.

walls with which they form a cross in plan, their planes of abutment being coincident with the planes of the walls. Mr. Francis Bond has said that the device of providing corner abutment with a single buttress set at 45°, so that the two walls share its support by receiving resolved components thereof, did not appear until the fourteenth century, and what is more interesting, is practically unknown in the west country where, nevertheless, it appears in these clock frames. Our Director, however, tells me that while the above statements are broadly true, the corner buttress does appear in thirteenth-century work, and that it would be unsafe to assign ironwork to a later date without reservation, merely because of its use. Possible inferences from these facts will appear among the general conclusions of this paper.

EXAMPLES OF EARLY CLOCKS AND JACKS

There are in existence three interesting movements which have been assigned to early dates, and may well be considered first as they are not associated with dials or jacks. These are the Dover Castle movement now on loan at the Science Museum, South Kensington, Mr. Percy Webster's movement in his residence at Leverstock Green, Herts., and the clock in a chamber beneath the bells in the north-west tower of Peterborough Cathedral. The 'Dover' and 'Webster' clocks, as we may designate them, are naturally considered together as they are almost identical in everything except in size. So close is the resemblance that they must surely have come from the same workshop, and almost, it would seem, from the same hands in the same year.

THE DOVER CASTLE CLOCK

There is considerable difficulty and confusion in the history of the Dover clock (pl. XLV), which has for long been accepted as the earliest extant example in which the foliot-balance is retained, and as one of the earliest remaining clocks in the world. In 1851 Captain (afterwards Admiral) W. H. Smyth, Director of the Society of Antiquaries, having received intimation of the existence of a very early clock at Dover Castle, went with Mr. Vulliamy and found ' an unsophisticated old clock bearing the date 1348 and the mark ℞.' At their suggestion it was moved from the tower stairs into the Armoury, placed on a pedestal, washed, brushed, and treated with boiled linseed oil.

'Mr. Vulliamy took the necessary measurements for a professional description of this remarkable relic with a view to its being published.'

In a letter from Mr. Bennet Woodcroft of the old Patents Office Museum to Sir Francis P. Smith, is the following:

' Mr. G. H. Sherrington the Armourer in charge who showed it to me said the date of the clock was 1348. That some miscreant a few years ago broke that portion of the iron from the clock on which the date was legibly cut and carried it off. That the clock is of Swiss Manufacture and not English.'

For permission to use this letter I am indebted to the authorities of the Science Museum, to whose charge the clock was committed in 1872.

Mr. Octavius Morgan, F.R.S., the well-known authority on clocks, in a posthumous paper in the *Horological Journal* in January 1917, vol. lix, says:

' Admiral Smyth thought he had discovered on a part of the frame a date in Arabic numerals, 1348, as also a monogram.' . . . ' I certainly was shown some rough indentation in the ironwork near the top of the inside of one of the standards, but I could not decipher any figures or letters ; indeed they seemed to me more like accidental rough-

nesses and depressions in the iron, proceeding from the forging and subsequent corrosion rather than intentional marks ; and the fact that Arabic numerals were not in common use at that early period is conclusive against it.   The late Mr. Albert Way, in company with Mr. Franks, examined the clock in 1851, and both were of the same opinion, and from the absence of ornamentation in the finishing, did not think it earlier than 1450 to 1500, and it may possibly be after that date.'

Mr. Baillie has very kindly furnished me with interesting items found by him in Exchequer Account, 462–26.   There are sixteen references to bell expenses for the Chapel in Dover Castle between 1345 and 3–6 Henry V, when the first mention of a clock appears :

Et solutum cuidam homini pro labore suo custodienti le Cloke pro tempore hujus compoti capienti per Annum xiij s. iiij d. per idem temporus vij li. vj s. vij d.

We are clearly faced with a problem at the outset, quite apart from any inferences to be drawn from the clock itself. Considering first the probable place of installation of the movement one cannot improve upon the following points in Mr. Morgan's article. Commenting on the fact that it was discovered as lumber on a tower stairway, he points out that there was no fitting place for it in the castle, and that it was probably installed in the tower of the ancient church and removed to the castle when the church became a ruin. He reasonably attributes its escape from the usual mutilation by the addition of a pendulum to the fact that it was never re-erected. Had the church remained it would probably have been ' converted ' or scrapped. Perhaps it was placed somewhat high up, as the existence of only two wheels in the going train must have necessitated a long run for the weight, and a considerable height, unless special provision was made. There is little reason for doubting that the existing clock is that referred to in the Exchequer Accounts of 1415–18. The strange confusion as to the supposed date and initials cannot be cleared up at present.

Captain Smyth's account is straightforward and definite, but it is unnecessary to attach great importance to the Armourer's words quoted in the letter to Sir Francis Smith, and the statement as to Swiss manufacture seems valueless.   Captain Smyth says ' bearing the date 1348 ', but Mr. Morgan says ' on a part of the frame '. Again, Captain Smyth merely prints ' 1348 '—naturally in Arabic numerals—without stating that such were used, while Mr. Morgan says ' a date in Arabic numerals ', and argues against the inscription on the ground that they were not in common use in that period.   In any case I am not convinced that these numerals could not have been used, though they would be unusual ; they occur freely in MSS. of the thirteenth century.

Unless Mr. Morgan had access to some more detailed account by Captain Smyth or Mr. Vulliamy, we must admit that he misquotes their claims in respect of the position of the inscription and of the use of Arabic numerals.   Clearly

we must choose between the following conclusions: (1) that the inscription
existed on some working part that was afterwards removed; (2) that it existed
on a plate riveted to the frame for its display; (3) that it was borne by some

Inches.

Tops of Standards.

Mr. Webster's Clock.

Dover Castle.

Cambridge.

S.W. Standard.

N.W. Standard.

Maker's
Mark.

a

Exeter. Quarter. Ch

Bottoms of Standards.
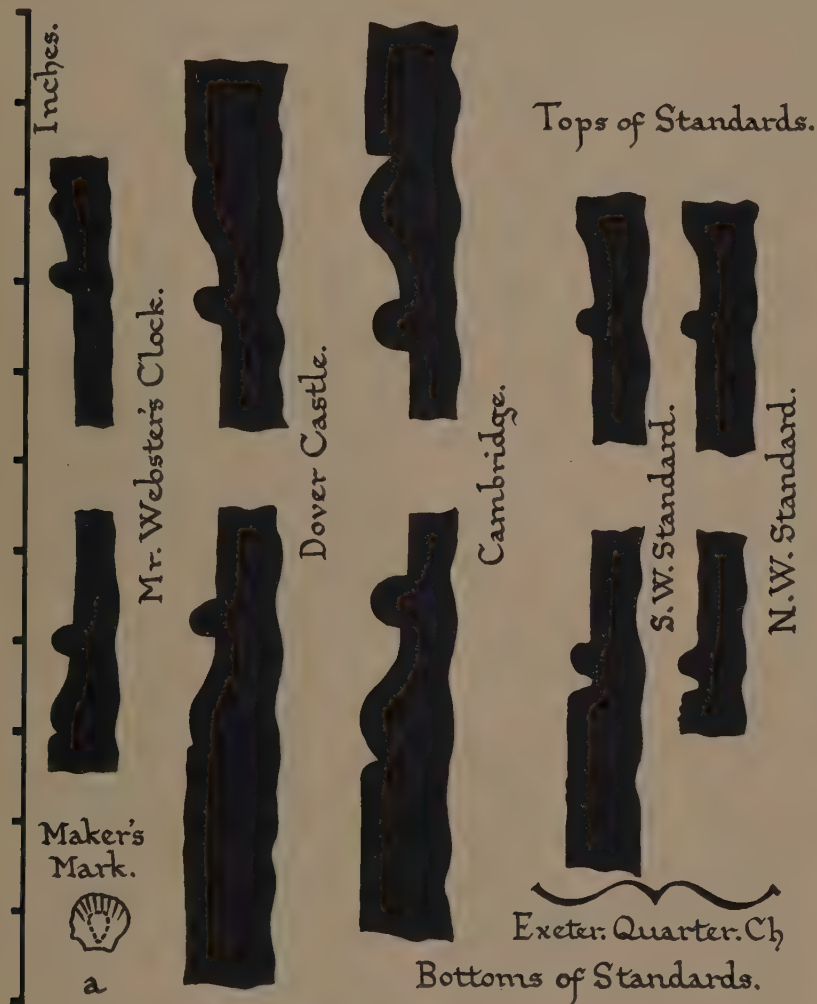
Fig. 2.   Moulding-profiles of iron standards from early clock movement.

other object such as a bell which was supposed to have been definitely associated
with the clock; (4) that there never was such an inscription anywhere on or
near the clock.

The first supposition must be examined in the light of our knowledge of
the 'Webster' clock which bears two beautiful deeply stamped maker's marks
(fig. 2 *a*), but not on removable parts. The ornamental termination of the iron
piece from which the foliot hangs in the 'Webster' clock (pl. XLVIII, figs. 1 and 3) is
missing in the Dover Castle works, but is too small to have borne the date and

initials which would, in any case, most naturally appear on the frame.   It is in the highest degree unlikely that an integral part of the clock was inscribed and has been lost, or that there was, as has been suggested, a plate or label bearing an inscription ; if such existed it was undoubtedly a comparatively modern addition. A theory was recently advanced that Captain Smyth and Mr. Vulliamy saw the inscription on a bell associated with the clock, but unless there was, by chance, such a bell in the tower where the clock was found, this cannot be accepted, as the bells associated with the clock had presumably hung in the now ruined church.   Mr. Morgan's opinion is, therefore, probably correct. There is no trace of such an inscription at the present time, nor is it likely that an early clock-maker would have cut or stamped it so feebly that a minute search over a corroded surface would be necessary in order to find it.

Examination of the work itself yields no very striking evidence as to its age.   Its general appearance has nothing that is definitely characteristic of any period of ornament, and I cannot help thinking that if this ironwork, being destitute of tradition, had been found in a fifteenth- or sixteenth-century manor-house, or in a second-hand shop, no unprejudiced antiquary would assign it to the fourteenth century, and those who ventured a guess would cautiously suggest a date 'round about' 1500.

The whole is of iron and the original foliot-balance is preserved—an interesting and most rare occurrence.   The main frame consists of four uprights of rectangular section, the longer side of the rectangle being parallel with the smaller dimension of the whole frame which is 28 in. by 20½ in. in plan, and 24 in. high without the feet.   The uprights are finished with finials bent outwards away from the smaller sides of the frame, and the edge is worked to head and base mouldings of great simplicity but of Gothic origin, though Mr. Morgan speaks of 'the absence of all Gothic ornament' as a mark of its late date (pls. XLV, XLVII, fig. 2, and fig. 2).   The longer horizontal bars at the bottom and top of the frame pass through holes in the four uprights, and in the ends of the shorter horizontal bars, outside the surfaces of which they are riveted over.   The top and bottom central bars pass through holes in the top and bottom side bars, and in the intermediate uprights, which are keyed to them by wedges or cotters.   The main uprights project downwards below the bottom horizontals, forming feet. It will be observed that there is no trace of the 'buttress treatment'.   The ogee-curved square-section finials have been cited as proof of late date, and a German authority holds the opinion, with which I disagree, that they indicate the seventeenth century.   Major C. J. P. Bailey, of the Metalwork Department at the Victoria and Albert Museum, does not think them incompatible with fourteenth-century workmanship, though he inclines towards a somewhat later period.

Pls. XLV, XLVII, fig. 2, XLVIII, figs. 1, 2, and 3, and fig. 2 show the extra-

ordinary similarity between the finials and mouldings of the Dover Castle and the 'Webster' clocks, and pl. XLVII, fig. 2, also shows the mouldings of the Cambridge mechanism. In this movement, recently acquired by the Science Museum from the church of St. Giles, Cambridge, the same idea is carried out, but the finish is so smooth, sharp, and feelingless that all beauty is lost. The finial knobs no longer have ogee tips but look like buns, and the ornaments have a value about equal to that generally seen in modern attempts at Norman church building. This clock, which affords an interesting case of the persistence of tradition, was made by William Clement in 1671, and was formerly the property of King's College; as it is four years earlier than the date generally given to the anchor escapement, it may be that there is no earlier example in existence.

There are no lantern-pinions in the Dover Castle clock; the four-arm crosses are lapped over and welded to the rims. The arbors are roughly octagonal where they are original. The locking-plates are normal and there are no screws. Spokes remain for winding the going-train, but the striking part has been altered, and with it the U-shaped spring and click which engages with the spokes of the main wheel when the winding effort ceases. The corresponding winding click or detent for the going-train is probably original, and takes the form of an annular spring acting on the spokes of the main or great wheel. There are only two wheels in the going-train, the great wheel and the escapement crown-wheel, and this is perhaps the best argument for the antiquity of the mechanism.

Both the Dover Castle and the 'Webster' clocks show little serious wear; in fact Mr. Webster thinks that his clock had a very brief working life. This seems to favour the idea of a comparatively late date for both, and though I do not care to venture a decided opinion as to the date of this remarkable work, I would like to suggest the provisional estimate of *circa* 1415–18, the date obtained from the disbursements in the earliest record yet found for a clock in the Castle church.

THE 'WEBSTER' CLOCK

This was rescued as a mass of rusting iron by Mr. Percy Webster, Worshipful Master of the Clockmakers' Company, at Cassiobury Manor. The manor, formerly a possession of St. Albans Abbey, was granted by the king in 1546 to Sir Richard Morison who built a house there. The earl of Essex built an entirely new house in 1677, and Mr. Webster considers there is good evidence that the clock was neither erected there nor made for use on the Estate. I agree with Mr. Webster that the clock was probably brought to the manor from elsewhere, and Mr. F. Hope-Jones, the late chairman of the British Horological Institute, has made the interesting suggestion that the clock might conceivably

have come from St. Albans Abbey after the Dissolution. One cannot go further than to mention this as an interesting but rather remote possibility.

Apart from the important maker's marks and one other peculiarity, a few words of description will suffice, as the resemblance to the Dover clock is so close that even the touch of the craftsman almost seems to emphasize it. The chief difference is in size, for though the proportions are not exactly uniform, the Dover movement is from $\frac{1}{4}$ to $\frac{1}{3}$ larger in all directions. The main going wheel is 12 in. in diameter, the great wheel of the strike being 11 in. The going-train barrel still carries its four spokes or capstan bars, but they have had a toothed hoop welded on to them, and this gears in a lantern-pinion to facilitate winding. The wooden barrel remains, and though much decayed, was skilfully stopped with glue and sawdust and made good by Mr. Webster. The notch support at the top, placed to hold the string on which the balance is hung, carries a small ogee knob of the same contour as the finials, a feature that probably had its counterpart originally on the Dover movement.

A curious difference between the two clocks is that the Dover crown (escapement) wheel rotates clockwise (as one faces the going part), while Mr. Webster's moves counter-clockwise, as will be seen by the set of the teeth in the two photographs. Mr. Webster offers the possible explanation that his clock had a revolving dial and fixed pointer, while that at Dover had the usual arrangement; he has accordingly painted hours on the hour-wheel (missing in the Dover example), and provided a pointer fixed to the frame. The arbors here and in the Dover clock are roughly octagonal, but one in the latter movement has been restored. The maker's mark, deeply stamped in the central cross-bar at the top, is of the highest interest, and may some day throw unexpected light upon the origin of the two clocks. A rubbing was made and has been traced and outlined in fig. 2 a. It appears to the author to be a 'cockle-shell' with a raised centre, which suggests (not very helpfully) St. James of Compostella, but Mr. Webster is inclined to think that the raised centre represents a face, and that the mark represents the female head on a fourteenth-century 'maiden-head' spoon.

THE PETERBOROUGH CATHEDRAL CLOCK

Only the striking portion of this mechanism remains, with fragments of an abandoned but comparatively modern going-part. The present going-part is several feet distant, connexion being made by means of a wire. It has been claimed as the oldest clock in working order in the kingdom, and, *if* primitive workmanship is a guide, it is certainly older than the Rye church clock, its only competitor in that respect. Apparently it never had a dial, and this suggests an early origin, even if parts have been renewed. No records are to hand except

those of late date, but it is known that John Wilson, of Peterborough, fitted in 1836 the Graham dead-beat escapement and movement which now form the going-part. It would be presumptuous to deny the date 1320, which has been claimed for it, but it appears almost equally presumptuous to put such a claim forward.

This extraordinarily quaint and delightful old machine (pl. XLVIII, fig. 4) is provided with a long drum of wood flanged at the right-hand end, the bearings being supported on wooden posts forming part of a rude framework built into a low chamber. The bearings and some parts of the winding arrangements have been renewed, but there is no evidence of the spokes referred to by Mr. J. J. Hall. During winding nearly 200 ft. of cord is roughly heaped on this drum, and is unwound from a double-flanged wooden wheel about 3 ft. in diameter. A second cord is wound on a long drum of small diameter, mounted on the same spindle as the wheel, so that as the first cord winds off from the wheel on to the first drum, the second cord forms a rough helix on the second drum and lifts the weight, which I understand is two or three hundredweight. The whole thus forms a most quaint rope-gearing.

A toothed wheel of iron fitted with striking pins is carried by the 'main' spindle on which the above wooden wheel is mounted and engages with a lantern-pinion on a spindle, the bearings of which are in upright wooden posts. The projecting end of this spindle carries a second toothed wheel fixed on the other side of the left-hand post, and this engages with a lantern-pinion on the spindle of the fly, the left-hand bearing of which is in yet another post. The main spindle also carries a small leaf-pinion which engages with teeth on the inner circumference of the locking-plate situated between the posts. The locking-plate and its shadow can be clearly discerned high in the photograph immediately above the winding-handle. A pivoted board is fixed to this last post so that it can be brought round to lock the fly for the protection of the clock-winder. The flanged wooden wheel is built up in a primitive manner with thick bars carrying the rim, and the style of workmanship is not unlike that of the famous windlass left by the medieval craftsmen in a neighbouring chamber. It will be noted that there are two lantern- and one leaf-pinion. I am somewhat disinclined to assign this remarkable work to a very early period; a search of records might yield results.

For the photograph and for much valuable assistance I am indebted to Mr. H. Plowman, the Head Verger.

THE FOUR FAMOUS WEST COUNTRY CLOCKS

It is proposed to consider these clocks in order, representing what appear to be the approximate dates of their more important remaining parts : (1) Wells,

Somerset; (2) Exeter, and (3) Ottery St. Mary, Devon; (4) Wimborne, Dorset. The only common feature is the astronomical dial which takes quite an individual form at Wells, but is similar in the case of the other three. Wells and Wimborne have jacks, while Ottery and Exeter have none.

The Lightfoot Legend

As all four clocks have at one time or another been attributed to Peter Lightfoot, the Glastonbury monk, that at Wimborne being persistently claimed as his work up to the present date, it is well to examine these claims at this point. The sole support of the whole legend appears to be a mere statement by Leland (sixteenth century) in his *Itinerary*.[1] I give it with its context to show that it is not even a quotation from a document, and therefore may have been only a legend or tradition even in his time. The names given refer to monuments:

In Transepto Eccl. in Merid. parte.
Thomas Stawel. Miles.
Horologium. Petrus Lightfote Monachus fecit hoc opus.
Geffre Fromont Abbas Glaston.

John of Glastonbury's description of an elaborate clock made by Abbot Adam of Sodbury (see p. 269) probably gave rise to the idea that Lightfoot was a monk under Sodbury, but is even this supposition justifiable? The words are :—*Magnum horologium, processionibus & spectaculis insignitum & organa mirae magnitudinis in eadem construxit* (1726 ed., p. 263). Canon Church considered this a fair description of the clock now at Wells, but John of Glaston wrote in the fifteenth century, and may have described the clock which then existed at the abbey, or may have taken the description from records, or the attribution to Sodbury from traditions. It certainly cannot be assumed that he described a clock made under Adam of Sodbury who was elected in 1323.

Leland's statement appears to be a description of what he saw himself, and it may be that it is the absence of any corresponding notice of a clock in his account of Wells that led to the story of removal to Wells after the Dissolution. I believe that on these slender lines hang the whole Lightfoot legend, the long accepted theories of the great clock in the north transept at Wells, and all the accretions relating to Wimborne, etc., with much of what I believe to be the false premises in almost all previous attempts to date our old clocks. I do not feel competent to judge whether a monk in 1325 would be known by such a surname as Lightfoot, but am under the impression that this is not very likely. There seems no solid ground for the belief that a monk named Lightfoot made a clock anywhere in the fourteenth century.

[1] Vol. iii, p. 83, ed. 1710, Oxford.

The next stage of inventive surmise apparently resulted from the assumption that as Lightfoot's supposed clock at Wells had an astronomical dial, the three others in the neighbourhood must be assigned to him because they also were so provided; but while the claim was not so common for Exeter and Ottery St. Mary, it has taken firm root at Wimborne, which probably has the latest of all the four clocks. So tenacious has the legend become that it has been most difficult to shake it off. Canon Church delivered the first blow by proving that Wells had a clock more than a century before the Dissolution of the Monasteries, and while the present writer, having indulged in pleasant versified imaginations depicting Peter Lightfoot at his work, found himself obliged to say that the Glaston monk could not have made the Wells clock, he clung to the legend in a modified form in his *Peter Lightfoot, Monk of Glastonbury and the Old Clock at Wells*, and has found the final obsequies of the said Peter, as inspirer or maker of any existing clock, a sad and sorry ceremony. The book in question, however, (published at the Avalon Press, Glastonbury, and hereafter referred to as *Peter Lightfoot*), contains matter that has aided the correction of error and the amplification of existing knowledge, and provides some information which will be found supplementary to the notes in this paper. The versified monologue at the end may depict the medieval craftsman and student at his work, even though it ceases to be applicable to an individual who is reluctantly ushered out of the realms of history into those of fancy, legend, and fiction. Possibly he lived at some period, and made a horologe for Glastonbury, but there his importance seems to end. We must now consider these clocks on their own merits, and sweep away all previous theories of any connexion with Glastonbury.

THE WELLS CATHEDRAL CLOCK

Facts about this clock will be summarized where they have already been set forth in *Peter Lightfoot*.

RECORDS

Item. in stipendium custodientis la clokk x s. per annum.

This is quoted by Canon Church as from the Chapter Rolls of 1394–5 (date repeated in *Peter Lightfoot*). Our Fellow Dr. J. Armitage Robinson, Dean of Wells, finds that although a similar entry occurs in 1394–5, the actual words belong to the roll 1492–3. A similar payment, and others involving clock-keepers, occur in 1400–1, 1407–8, and 1408–9, after which there are no references to the clock until about 1600.

The Mechanism of the Wells Cathedral Clock

This was removed in about 1838 to the undercroft of the Chapter House, where it remained injured and neglected until some time after Mr. Octavius Morgan had pleaded for its restoration and proper treatment. The existing dial, jacks, and horsemen were operated by new works that subsequently gave place to a third movement. In about 1871, the original movement was lent by the Dean and Chapter to the old Patent Office Museum, where it was subsequently put in going order, and provided with certain new brass wheels and appropriate bells. In about 1883 it was transferred to the Science Museum at South Kensington, where, during the day-time, it is still at work (pl. L, fig. 2).

The general arrangement of the standards and cross-bars forms a frame that appears at first to be of the usual type, but differs essentially from the Dover, 'Webster', and Rye schemes in having the two halves occupied respectively by the going and the quarter-striking trains. The hour-striking part is contained in an extension that appears to be of the same date. The inclusion of quarter-striking as part of the original design is, in my opinion, an argument against the very early date formerly claimed for Wells. The corner standards are of buttress type, set anglewise with moulded set-offs at the bottom, but the architectural idea is abandoned at the heads, which have an unfinished appearance. This would seem to be an early and tentative example of buttress treatment. The mouldings are very simple, but exhibit a definite ogee which is certainly not incompatible with the date 1392 (fig. 1). The intermediate uprights are flat or 'strap' bars finished with delicate, rather small, battlement-work, and simple but highly effective incised lines—horizontal and criss-cross—which appear elsewhere on this clock (pl. XLIX, b), and are used in exactly the same manner at Rye. A smaller example occurs in pl. XLIX, a. In some parts there are angle-bars to strengthen the structure where members meet at right angles; the triangular space, so formed, is occupied by charming cusps of Gothic type, and in one case a nearly equilateral triangle in the hour-striking part has a beautiful cusped trefoil (pl. XLIX, a, c, and d). The author's opinion that the whole of this ornament is in harmony with the estimated date of 1392, is supported by the authority of our Director. All rigidly connected parts are fastened by riveting or by cotter-pins.

The dimensions (given in *Peter Lightfoot* as about 5 ft. cube) are—for the plan of the main early frame, 31 in. by 44½ in., the height above the wooden 'horse' being 47¼ in. The extension makes the whole length 61 in. There is evidence that a foliot-balance existed, but the clock is now controlled by a comparatively modern pendulum. Lantern-pinions are used throughout, the earlier ones having octagonal end-discs. All the old wheels have four spokes welded

a

b

c
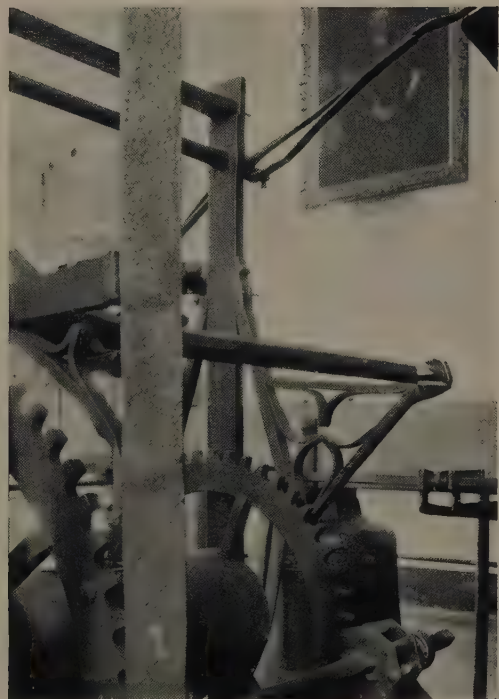
d

Wells Cathedral clock : Details of mechanism

Fig. 1. Wells Cathedral clock; the charging
horsemen
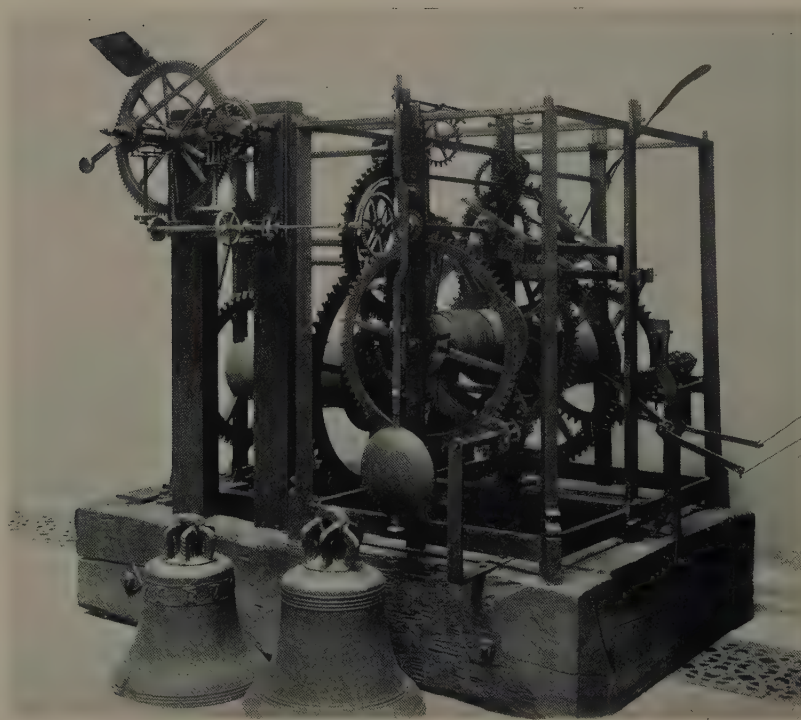
Fig. 2. Mechanism of Wells Cathedral clock

By permission of the Dean of Wells, the Science Museum, and the Avalon Press

over the inner edge of the rim in the best manner, and the lapping ends are pleasantly foliated in the case of the great wheel of the going-part (fig. 1, *a*). The arbors are roughly octagonal, and the locking-plates are normal (pl. XLIX, *a*). The thickness of the wheels is from ½ in. to ¾ in.

The winding drums probably had spokes or capstan bars, as empty slots remain in the barrels, but all three trains are now wound by handles operating toothed wheels engaging with lantern-pinions; these pinions, being inconsistent with all the others in having circular end-discs and somewhat crude riveting for holding the bars, are almost certainly later additions, and fully support the theory of alteration from 'capstan' winding. One is seen in pl. XLIX, *d*, and an octagonal example will be found at the left-hand end of the shaft in pl. XLIX, *c*. The winding clicks engage with the wheel-spokes in all three trains and consist of strip-springs taking circular form for about 60° in the rims of the barrels acting upon pivoted detents. There are no old screws anywhere in this movement, and the bolts, nuts, screws, and washers to be found in the 'horse' of wood seem to me quite obviously modern, though they have recently received rather half-hearted credence as original.

THE DIALS AT WELLS

The interior dial, with its platform, turret, and horsemen above it, is wrongly and inadequately described in most existing accounts. It fits into an arch on the west side of the aisled north transept and rests on a stone screen which, though in the Perpendicular style, is quite in character with the end of the fourteenth century. The whole was clearly made for its present position, and there remains behind it a chamber of painted timber and boarding ornamented with conventional foliation and red flowers having white centres and five in- dented petals; each flower is surrounded by a white ring. The clock chamber is considerably decayed, and the foliation is nearly obliterated. The dial, an astro- nomical one (pl. LI, fig. 1), is 6 ft. 4½ in. in diameter, and is contained in a square frame, the space on either side between the frame and the arch mouldings being filled by boarding, painted with rather nondescript red foliage on a black ground; this might be Renaissance colouring. The square frame has coloured mouldings forming a wider band at the top than at the sides and bottom; the innermost moulding has 'barber's-pole' ornament.

In the corner spandrils are angels holding heads, which, as I have shown elsewhere, represent the four winds. These angels have red and gold halos, wings and belts, the upper two being of superior workmanship and preservation, with robes apparently of rich material. It may be that the lower ones have been re- painted. The heads of the winds, which are much larger than those of the angels, have distended cheeks, and there are faint remains of the usual conventional

puffs of vapour, directed in this case from their mouths towards the centre of the dial, where is the ball representing the earth (pl. LII, fig. 2, *a*). Within the outer rim of the dial are twenty-four discs marking the twenty-four hours of the day in two semicircles of twelve hours each, mid-day being at the top.

The annular space immediately within the rim is sprinkled with stars on a blue ground, and probably represents the firmament of what we call fixed stars, but it does not rotate. Over it, and within the circle of the discs, there moves a gilt sun with wavy rays (pl. LII, fig. 1, and see Isaac von Harbrecht's clock, at the British Museum). Next in order comes a minute-circle in arabic numerals, with a small indicating star (pl. LII, fig. 2), of course a much later addition, as minute division was unknown in the middle ages. Concentrically within this is a disc showing the moon's age in arabic numerals (pl. LII, fig. 1). This revolves once in twenty-four hours, and a copper disc of smaller diameter (pl. LII, fig. 2), which I call the moon-disc, revolves at slightly lower speed and carries a crescent-pointer, representing the moon ; this shows the moon's age on the ring, the difference of speed between moon-disc and ring being such that coincidence between the pointer and a given figure on the ring occurs once in the approximate synodic period of twenty-nine and a half days.

The moon-disc, painted with greenish clouds, and sprinkled with stars, carries a pivoted circular disc on which is a female personification of the moon (pl. LII, fig. 2). This quaint little lady, waist-high in clouds, is partly surrounded by a label bearing the motto *Sic peragrat Phoebe*, apparently in sixteenth-century characters, and perhaps replacing an earlier inscription. Her disc is pivoted and weighted so that she remains upright as she rotates. Diametrically opposite to Phoebe on the moon-plate is an opening which, in passing over a heart-shaped patch of gold behind, gives the appearance of a waxing and waning golden moon, the whole cycle of change occupying the synodic period. Round the opening are the words *Sphericus archetypum globus hic monstrat microcosmum*, an inscription which gave me great trouble, as from the medieval point of view it is nonsense. Part of the word 'globus' is obscured by the central boss formed by the earth and its immediate surroundings ; the preposterous versions given by various writers appear in *Peter Lightfoot*, where the whole difficulty raised by the inscription is set forth in detail, the final conclusion reached being that the word *microcosmum* was probably the artist's mistake for *macrocosmum*. This, the true explanation, remained unproven until Dr. Armitage Robinson found, in a rare book published in London in 1600 and known to be by Camden, the plain statement that the now injured circular inscription laid down by Abbot Ware and Ordericus of Rome in the sanctuary at Westminster Abbey did, in his time, contain the word *macrocosmum* as recorded by the monk Flete in about 1425. Mr. Francis Bond made the same mistake, therefore, as the painter of

the Wells dial; the present writer has to confess that after discussing the matter fully in *Peter Lightfoot* he triumphantly concluded with an accidental reversal of the two words, on p. 27! The word *macrocosmum*, of course, makes a reasonable statement that 'This rounded globe demonstrates the Macrocosm, its archetype'.

At the centre of all is a very small Earth surrounded by rose-like sculpture, possibly representing the spheres of air and fire (pl. LII, fig. 2, *a*). Above the dial-frame in the space under the apex of the arch is a semi-octagonal platform with an embattled edge that is continued along the top moulding of the frame. On the under side is a succession of fine mouldings arranged octagonally and receding towards the centre, where is a beautiful group of gilt leaves that seems to have escaped general notice. This is an important evidential feature, as the style of the sculpture is certainly not late (pl. LII, fig. 3). Our Director, seeing a photograph of it, attributed it to *circa* 1415–20, but when asked whether 1392 was not a possible date, especially in the west country, said he considered it quite compatible with the style of carving. The surrounding mouldings are bold and good, the outermost large hollow having gilt five-petalled flowers and at the angles four fleurs-de-lys, both gilt and embossed; the whole range of mouldings is painted in red, white, and blue.

The Charging Horsemen at Wells

The platform is the battling ground for the four charging horsemen who are described in detail in *Peter Lightfoot*. They appear through moulded arched openings of Gothic form pierced in painted board-work similar to that on either side of the dial-frame. These openings are flanked by small blind arches represented in paint. The panelled and battlemented turret round which the horsemen ride is coloured in gold (or yellow), black, white, and red.

It is noteworthy that in the *Weiss Koenig*, one of Hans Burgkmair's illustrations depicts a group of young men, including the youthful Maximilian, playing at jousting with boy knights on horseback, of about the size of the Wells men. These are pivoted at the hips by pins passing through the saddles as at Wells, and are advanced against each other on a board by the players; if one is struck fairly on shield or helmet, he falls backward on his horse and is vanquished, precisely as in the case of the man who is conquered about ten times at every hour above the Wells dial. It is interesting to note that this toy reappeared in shops in 1927. One of the Wells horsemen (pl. L, fig. 1, and pl. LIII) has a red coat, white legs, and gilt headgear. The horse is black; the saddle, which is splayed outwards and downwards with concave outline, is gilt-edged, and the belly-band and reins are red.

The unique photographs of two of the horsemen, of the moon-disc, and of the plate behind it, taken during the recent repairs by the British Goldsmiths'

Alliance of Bristol, were most kindly supplied by the Alliance, and are published for the first time by permission of the Dean of Wells. The exterior dial on the north face of the north transept is a modern 'make-up' of plaster, etc.

'Jack Blandifer' at Wells

Concerning this interesting jack there is not much to add to the description in *Peter Lightfoot*, except that Mr. P. G. Trendell, of the Textiles Department at the Victoria and Albert Museum, is in agreement with the early dating of the figure, and that, following upon the publication of *Peter Lightfoot*, Jack Blandifer has resumed his duty of striking the hour with a hammer. It was found at the same time that he had been arranged to move his head, which he now does with great effect (pl. LV, fig. 1). This jack is almost certainly the earliest in the country and may be the earliest in existence. He has so obviously been repainted that his colours may be omitted from description. That the Lightfoot tradition is both old and popular is shown by a reference in *The Cathedral Church of Wells*, 1824, by Britton, who says that he was 'without punning intent, popularly called Peter Lightfoot'.

I have no evidence as to the origin or date of the name 'Jack Blandifer'.

The Exterior Quarter-Jacks at Wells

These, as armoured jacks, have only one serious rival—at Southwold—and as a pair of quarter-jacks they are probably the earliest and best in the country (pls. LI, fig. 2, LIV, fig. 1). They are said to be four feet in height and they turn bodily about vertical spindles, striking the bells with axes. The sculpture is fine, the armour magnificent, and the features severe and dignified. Their date is about 1485–90. A detailed description was incorporated in Canon Church's paper in the *Proceedings of the Somersetshire Archaeological Society*.

Having due regard to all evidential details of mechanism, etc., I believe that the date 1392 is acceptable for the greater part of the work at Wells and South Kensington, though doubtless several wheels, spindles, and other wearing parts have been renewed. In this I have the support of our Director, who, though he would have been inclined to assign a somewhat later date to the battlemented edging of the platform and turret taken by themselves, considers the whole work to be compatible with the date of its first record. I do not believe that the country contains any remains of an earlier clock unless evidence is brought to light to justify the claims of the doubtful Peterborough fragment or of the Dover Castle and 'Webster' clocks. Such a conclusion, though destructive of much deeply rooted prejudice and tradition and of a large proportion of the interest and glamour elsewhere, would raise the Wells clock to a position of supremacy for antiquity such as it already occupies in respect of its beauty,
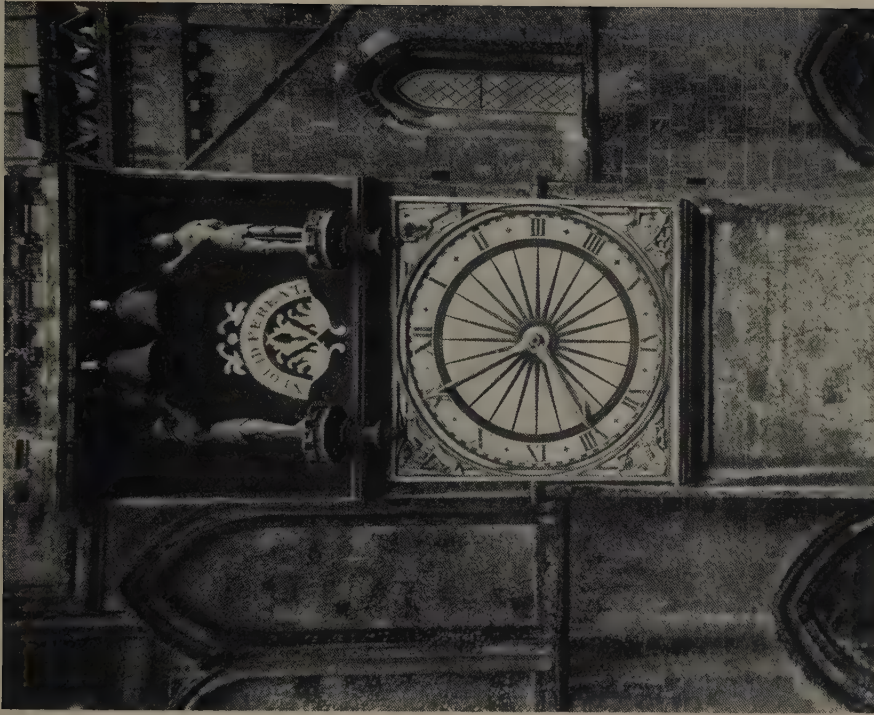
Fig. 2. Wells Cathedral clock; exterior quarter-jacks and dial
By permission of the Avalon Press
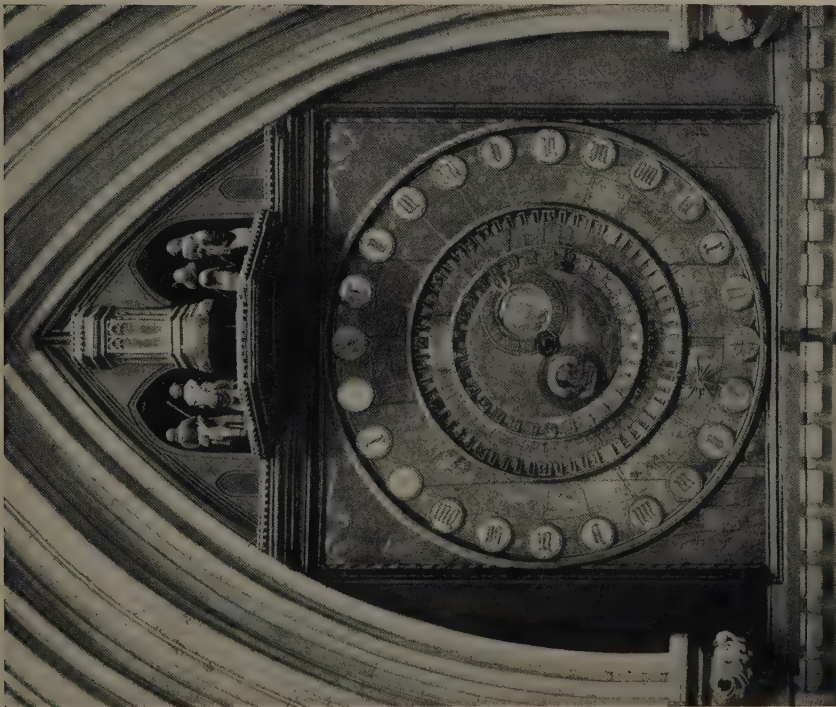
Fig. 1. Wells Cathedral clock; interior dial
Photograph, Phillips, Wells. By permission of Mr. Phillips and the Avalon Press

Published by the Society of Antiquaries of London, 1928

Fig. 2. Wells: clock dial. Moon-disc with moon-index, inscription, minute pointer, and Phoebe. *a*, Earth ball and sublunary spheres

Photograph, British Goldsmiths' Alliance

Fig. 3: Wells: the clock. Leaf-carving beneath platform

Fig. 1. Wells: clock dial. Hour-index, Lunar ring, and gold patch for lunation

Photograph, British Goldsmiths' Alliance

quaintness, and elaboration.   Indeed, it seems almost fair to claim for it super-
lative interest among the really ancient horologes of the world, for though
Strassburg and other places possess more imposing and elaborate clocks, they
are generally of much later date in their main features.   It may be, too, that
Wells affords the earliest known example of lunation with a waxing and waning
moon represented, as in later clocks, by the appearance of a painted patch
through an orifice rather than by rotating spheres as at Exeter, Ottery, and
Wimborne.

Delightful as it is to see the Wells mechanism under good conditions at
Kensington, it must be admitted that its removal was a lamentable and un-
necessary piece of vandalism, for the alleged bad time-keeping cannot have
been less remediable than at Rye and is not now very serious, while the self-
contained and complete system would, with all its alterations and additions,
have been a still greater treasure at Wells.   Moreover, modern horologists
could probably have designed a control arrangement by means of which a new
movement would keep the old one in time.

It would now be a very serious problem to reinstal and control it in the old
clock-loft and to make it, at the same time, accessible to students.

The work at Wells retains much original colour, and in order to prevent
the changes resulting from continued repainting, it would be an excellent thing
if some skilled person could make an exact reproduction to be kept carefully as
a record.   It would be of the highest interest to discover what colour treatment
lies now under the paint on Jack Blandifer's person, especially on his face.
An astronomical clock elsewhere has been grievously repainted, and it is to be
hoped that it can and will be restored by skilled persons and protected from
further alteration.

THE EXETER CATHEDRAL CLOCK

RECORDS

Next in order of age and importance comes the Exeter clock, though it
has been wrongly claimed as 'the oldest example in existence'.   Its date has
probably been more discussed than that of any other English clock.   Dealing
first with the records, we find that the starting-point of all existing discussions
and arguments is incorrect.   Writers on the subject have built far too much on
the belief that *absence* of references in Fabric Rolls argues absence of clocks,
whereas nothing but an unbroken series of accounts known to include all
expenses and to refer in detail to all work done, for emolument or otherwise,
would have value as *negative* evidence.   A notable instance of this fallacy occurs
in a fairly recent article in which the writer says : 'I have somewhere read that
Exeter Cathedral possessed a clock in the year 1284.   But I have examined

the *Fabric Roll* for that year and can find no such entry.'   The fact is that the date 1284 for an Exeter horologe is correct, while the absence of a reference in the Fabric Rolls merely shows that no expense for a horologe was entered for that year but does not prove that none was incurred.   The very Patent Roll which has for half a century been misquoted as recording the presence of a clock in 1317 carries it in reality back to 1284.   Even in the latter-day articles the garbled statement in G. Oliver's *Lives of the Bishops of Exeter*, 1861, is repeated. He gives the Patent Roll for 1317 as recording a confirmation by Edward II of Bishop Stapledon's grant of a tenement in Paignton to Robert Fitzwalter by the service of one penny and of ringing the bells and repairing the organs and clocks in the church of Exeter.   Further mention is made of the Patent Roll of 1318 as proving that Exeter Cathedral had a clock in that year.   Feeling these statements to be unsatisfactory, and suspecting the appearance of Robert Fitzwalter as a mechanic, I examined the Rolls for 1317 and 1318 with interesting results :

There is only one entry and that is in 1318, on membrane 5, part I.   This is an *Inspeximus* and confirmation of a writing of 1284, by which Bishop Peter Quivil (not Stapledon) grants to Roger de Ropford the bell-founder (*campani-stario*) and Agnes his wife, and Walter their son, and their heirs, the tenement which Nicholas de Peynton, the bishop's bondman, held in 'Peyngton' subject to a yearly rent of 1*d.* for every secular service.

' and the said Roger, Agnes and Walter and their heirs shall make or cause to be made at the costs of the Chapter of Exeter, the bells (*campanas*) of the church and as often as need shall be they shall repair or cause to be repaired the musical instruments (*organa*) and clock (*orologium*) ; while so employed all necessaries of food and drink shall be supplied to them : dated in the chapter of Exeter II Ides of July 1284.'[1]

There is nothing about ringing the bells, and the word *orologium* (singular) confirmed my suspicion that 'clocks' was a wrong translation.   The roll says that by this confirmation the tenement is granted (in entail) to their son and heir Robert.   Hence has arisen, in place of the proper translation 'the son of Walter', the surname 'Fitzwalter', which, of course, occurs in Medieval Latin form as *Filius Walteri*.   Much more important than all this is the fact that Exeter's horologium existed in 1284, for this not only affects all argument and inference of local value, but seems at present to distinguish it as the earliest recorded horologe in the country, although no vestige of it remains and we are ignorant as to its nature.

The Rev. Philip Freeman, M.A., in his *Architectural History of Exeter*

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[1] An omission in the Calendar, to which I drew attention, has been rectified in the Record Office copy, by an added pencil note.

Cathedral, 1873, quotes largely from the Fabric Rolls and most of his references to the clock appear in 'Historical and Other Records of an Ancient Astronomical Clock in the Cathedral Church of St. Peter, Exeter,' by John James Hall, F.R.A.S., *Horological Journal*, June 1913, vol. lv, etc. It is unnecessary to repeat them here, except where they have special interest or provide good evidence. The first among these is 1328–9, *pro vertinell fact pro horologio eccl.* the third word being given as printed. The whole is rendered 'Hinges for the clock in the nave'. Why the word 'nave' is given I do not understand, though there may be some explicable confusion of references in which I am at fault. At any rate it is repeated in quite modern writings on the subject. The word *vertinell* does not seem to exist and is probably a misreading or a misprint for *verteuell*, Lat. *vertevella*, or some other form of the word which appears also as *vervall*, *vervel*, *vervile*, *vell*, *vervail*, *vervil*, *varuell*, *varvill*, and *varvel.* 'Hinges' seems the probable equivalent, but the word gives no clue to the type of horologe.

The next important entry is 1376–7 when, within a quarter of a year, 119s. 9d. was spent *circa cameram in boreali turre pro horologio quod vocatur clokke de novo construendam.* The whole expense is stated to be £10 6s. 5½d. *nove camere pro horologio* and it includes cramps and iron bolts *pro pinnaculo frontis ecclesie* 4s. 7d. and 25 crockets *pro eodem pinnaculo* 13d.

In 1381 *custodes* to look after the clock, ring bells, etc., are to receive 3d. from each Canon and ask no more.

In 1390 occurs the first real evidence (if accurately quoted) of a weight-driven clock. The expenditure is for cord for a clock-weight, 10s. 10d. The charge seems disproportionate and might well be verified with other extracts from the Exeter Fabric Rolls. Numerous repairs are recorded between 1397 and 1420.

In 1423–4 there is an important payment to John Budde of Exeter for painting the new clock made in the cathedral church of Exeter, 73s. 4d. 'For iron bars bought *pro novo horologio conservando.*' Some repairs follow within a few years, and expenses for John Woolston and John Umfray, a mason, riding to Barnstaple there to seek 'Roger Clokmaker'.

The last pre-Reformation extract lies between the dates 1432–5.

All this is very difficult to interpret. In the first place Mr. Hall seems to assume that the 'new clock' referred to in 1423–4 is the supposed 1317 clock still remaining, an assumption which is even less justifiable now that the date 1317 is corrected to 1284, making the clock 140 years old. Further, the only portion of the existing works having any reasonable claim to real antiquity has corner buttress-standards of a design which would be rather unexpected in architectural detail of 1317, would be unlikely in 1284, and would be still more unlikely at either date in west country work. Moreover, our Director confirms my view that the mouldings (see fig. 2) cannot be of so early a date.

It is remarkable that the very heavy expenses for the clock-chamber in the North Tower were incurred in 1376, very soon after the date when Mr. G. H. Baillie's theory would lead one to expect the replacement of a clepsydra by a clock, and that the reference contains one of the very early examples of the use of the word 'clokke'. If we accept this theory the natural outcome is to believe that this chamber was made for a new clock of the new type, and that it was still called the 'new' clock in 1423–4. If that is so, however, why is its instalment followed by incessant repairs up to about 1423, and why should the clock need conserving or strengthening by iron bars within fifty years? It might need painting, though that would seem unlikely in an Exeter 'small and white and clean' like William Morris's Chaucerian London. Again, would a clock even forty-eight years old be called the 'new clock'? It seems highly unlikely that the great expense incurred in the making of the clock-chamber was for the housing of an existing water-clock to be removed from elsewhere. Persons who cling to the belief that most medieval horologes were weight-driven would probably explain it all as follows:—

Some clock existed in 1284 and was moved to a specially made clock-chamber in 1376–7. Age and perhaps removal made it increasingly troublesome until 1423–4, when it was entirely renewed.

I consider, however, that all existing remains are subsequent even to this comparatively late date. That the existing dial followed not very long after this period is not a troublesome fact, as the idea of a noble new astronomical dial might have arisen at any time if the original was modest or thought old-fashioned.

Supporters of Mr. Baillie's views will rightly ask whether so much would be spent on a new chamber for so old and worn a clock, and it seems that no theory yet put forward really covers all the facts. The graph of expenditure during the period 1377–1420 shows how the repair of the clock itself cost increasing sums until in 1405–6 it reached 52s. 4d., a sum sufficient in that period to pay a fairly skilled labourer for several months of work and for the necessary material (fig. 3). In 1420 is spent the great sum of £6 10s., but this includes work on bells, the proportion for which is not recorded. Unknown expenditures on the clock in three of the rolls are indicated by question-marks against dot-and-dash lines.

The Mechanism of the Exeter Cathedral Clock

The highest praise must be accorded to the work of Mr. J. J. Hall in rescuing and re-erecting all that could be collected of the old abandoned iron-work. This he installed in Precentor Sylke's chantry, where the going part still works with a modern pendulum, though quite unconnected with the dial now
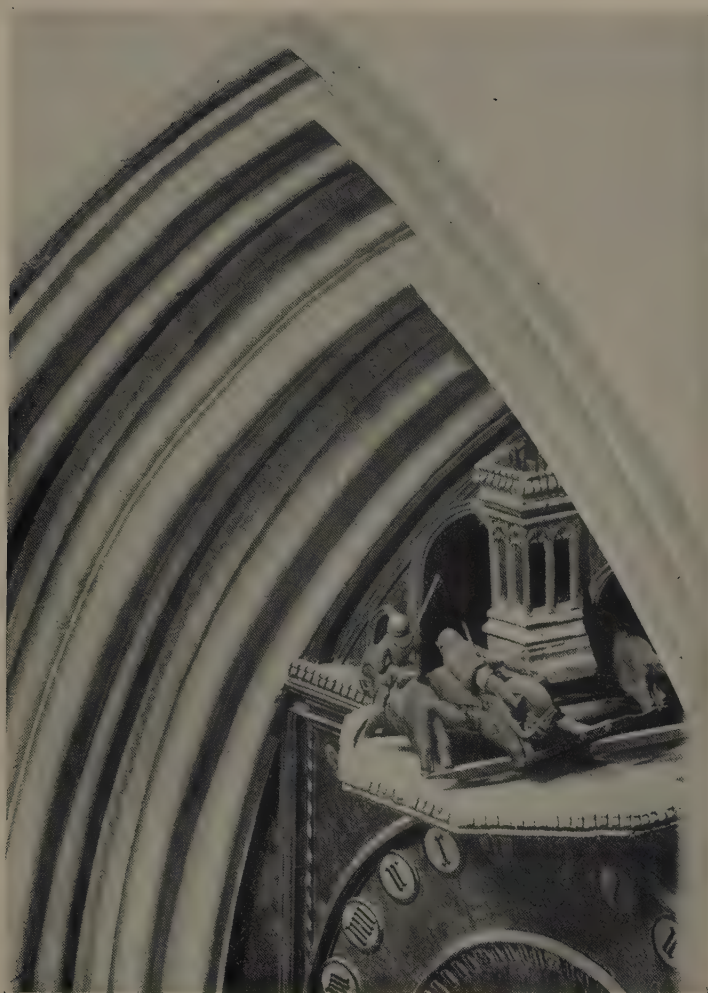
Fig. 1. Wells: the knock-out blow

By permission of the Avalon Press

Fig. 2. Wells: two of the charging horsemen

Photograph British Goldsmiths' Alliance

Fig. 1. Wells : exterior quarter-jacks

Photograph, Phillips, Wells. By permission of Mr. Phillips and the Avalon Press

Fig. 2. Exeter clock mechanism : quarter chiming
movement and corner finial of going-part

Fig. 3. Exeter clock mechanism : corner
standard of quarter chiming movement

operated by a recent movement.   Interesting as the old works are, it is impos-
sible to support the claim that they include 'at least in part, the oldest church
clock in existence', and while the author feels bound to differ *in toto* from
Mr. Hall's conclusions, he cannot do better than refer the reader to the series
of articles quoted above for a careful description of the mechanical details of
what remains.

EXETER.

Fabric Rolls. 1377~1420.
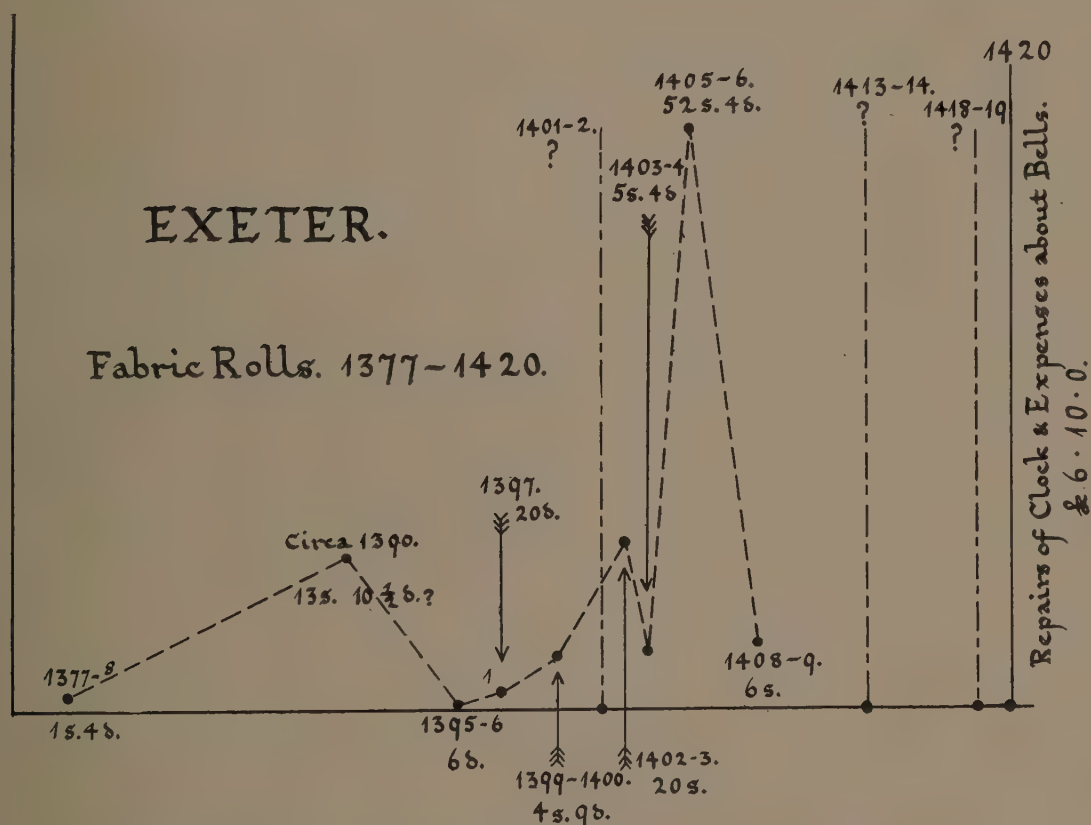
Fig. 3.   Exeter Cathedral clock.   Graph showing expenditure between 1377 and 1420.

The material is, of course, iron; there has been a foliot-balance; there are
no lantern-pinions, but there were winding-spokes until 1882, when they were
cut off from the striking part.   The locking-wheel or plate exhibits the pecu-
liarity of internal V-notches referred to on p. 277, 8, Design of Locking-
plates.   The going part claimed by Mr. Hall as older than the striking part has
the upper members of the frame secured to the corner standards by screw-nuts
provided with tails that are curled to form spiral finials, the spirals having several
turns like a clock-spring (pl. LIV, figs. 2 and 3).   Parts are fastened by older
devices, but the bottoms of the standards are also provided with screw-threads.
The threads and nuts, which are not very specially rude or clumsy, are obviously

original and belong to their frame; the finials are quite unmedieval in style. There is nothing whatever about any other details of this ironwork to tempt one to admit the screws as a wonderful and unique early example, and the whole has the appearance of sixteenth- or seventeenth-century craftsmanship. If the early date of the going part vanishes there may vanish with it the claim that it contains the earliest known example of a 'power-maintaining mechanism'.

The hour-striking part has been very largely renewed, and has no flavour whatever of the 'Gothic' period, but the quarter-striking mechanism claimed by Mr. Hall as appearing to be 'very much older than the other portions' has corner standards set diagonally and crudely moulded, and is entirely secured by tenon and cotter (pl. LIV, figs. 2 and 3). It is saddled above the going part by crude bent iron straps, and is clearly not in its original position. This method of mounting is claimed as undoubted evidence of antiquity—apparently by reason of its mere crudity. From the fact that the screwed tops of the going-frame standards have been made long enough to accommodate these straps, and that the finial-nuts and screws would have been needlessly long without the straps we may infer the later date of the going part. Mr. Hall is undoubtedly right in assigning the earliest date to the quarter-striking part, but that date is most likely to be fifteenth or sixteenth century or even later; not only are the standards of the angle buttress type, but the treatment of the mouldings does not appear early.

The Dial and Dial-case at Exeter Cathedral

The dial-case is far more satisfactory in its wealth of evidential architectural detail (pl. LV, fig. 2). Mr. Hall reproduces a valuable illustration from Carter's *Measured Drawings of Exeter Cathedral*, published by authority of Parliament, and *Sumptibus Soc. Antiquar. Londini 24th April 1797*. The drawing shows that the top of the dial-case was surmounted by beautiful cresting, and that small flying buttresses remained at the sides. The buttresses and most of the cresting have been ruthlessly destroyed, a most objectionable minute dial surmounts the whole, and the stonework has been disfigured with inappropriate and vulgar colour-work and gilding. These unfortunate barbarities apparently belong to the eighteenth and nineteenth centuries. Enough sculpture remains, however, to enable us to assign the dial-case to the late Perpendicular period. Some of the detail has a west country flavour and, on the whole, the author is inclined to suggest *c.* 1480, an approximate date with which our Director agrees. A tradition, the origin of which it would be interesting to trace, gives the clock the date 1480.

The whole is of stone and very large, but the dial-plate is of wood; as

Mr. Hall gives a full description of the astronomical parts, it is only necessary to say a few words about the character of the ornament, which he has not discussed at length. The great square moulded framework is flanked on either side by narrow vertical cinquefoil panels in two tiers, and wider panels fill the sides. The remains of the rather curious cresting are of the same period. The boldly worked mouldings of the lower part of the frame include a broad conventionalized vine with heavy stem and large squared gilt leaves, having curious raised double centres in black. Similar leaves occur elsewhere in west country churches. The bunches of grapes are highly conventionalized, so that they almost resemble fir-cones. Beneath the lowest moulding is a great supporting corbel of stone nearly 10 ft. wide. It has a fine range of mouldings, the innermost and lowest, near the wall, displaying five conventionalized gilt leaf-ornaments typical of the period. Mr. Hall justly complains of the removal of the astronomical wheels 'presumably to copy' in 1885. The gross carelessness of those in authority at the time makes one wish heartily that the existing clocks could be properly scheduled and protected, for these wheels were never returned, and Mr. Hall has vainly tried to recover them.

THE OTTERY ST. MARY CHURCH CLOCK

In 1906 the mechanism of this clock, like that at Exeter, was rescued from debris and reinstated, with great ability and through much arduous work, by Mr. J. J. Hall, with whom it was a labour of love; but, interesting as it is, the claims put forward for its antiquity are considerably weaker than those in the case of Exeter. A full description is given in 'The Story of Bishop Grandisson's Clock in the Church of St. Mary of Ottery', *Horological Journal*, Nov. 1907, etc., vol. l.

RECORDS

It is impossible to say what might result from careful examination of all the Fabric Rolls, but the earliest date quoted by Mr. Hall is 1437–8: *Et pro Custodia Horologii*, 3s. 4d. A later entry records a payment of 10s. 4d. to an Exeter clockmaker for repairs and incidental expenses in 1483. Bishop Grandisson obtained licence for his collegiate church in 1337 and, arguing from analogy with Exeter, and upon the untenable theory that without a clock services could not be organized, and that a clock was a '*sine quâ non*, an absolute necessity', Mr. Hall assigns the clock to Grandisson and dates it 1340. Grandisson's statutes and directions for the fittings of the church and for its government are minutely particular, yet they contain no reference to any kind of horologe. We are, in truth, driven to internal evidence in this case, and

having been forced to suspect most of the supposed proofs of early date hitherto cited with reference to mechanism, we imperceptibly reach a new attitude of mind in which the discovery in a movement, such as that at Ottery, of features having positive value as evidence of late date, destroys all remaining faith in features of workmanship which are supposed to be proofs of early date, wherever else they are found.

THE MECHANISM AT OTTERY ST. MARY

Such evidence is plainly apparent in the Ottery ironwork, which has a wealth of screw fastenings with ordinary square nuts. The threads are not 'Whitworth', but they are neither rude nor unsophisticated. The remaining finials are curl-ended nuts of a simpler design than those at Exeter, and they more resemble the head of a shepherd's crook without the outward bend at the tip of the curved portion (pl. LV, fig. 4). Cotter and wedge fastenings are present but are no evidence of early date, as they remained in use long after the middle ages. There is nothing faintly suggestive of the Gothic period, and though the work might be of the late fifteenth century, it has the appearance of a sixteenth- or seventeenth-century movement. For the rest the wheels have four spokes, and most are welded over on either side of the rim. The going-train is wound with spokes or capstan-bars, as in the Dover Castle movement, and the striking-train was similarly furnished formerly. This is claimed as showing very early date, but is valueless for that purpose. There has been a foliot-balance as in all clocks up to the seventeenth century. The striking part has the V-shaped notch locking-plate with a later and normal locking-plate superimposed. There are no lantern-pinions, and the arbors are squared.

THE OTTERY CLOCK GALLERY

The clock gallery (pl. LV, fig. 3), much altered, does not appear to have any features which justify the statement that it belongs to the fourteenth century, a remark that applies equally to the staircase of solid angular oaken blocks fixed on sloping supports, though this is a pleasing and interesting structure.

THE OTTERY DIAL AND DIAL-CASE

The dial-case (pl. LV, fig. 3), which is fully described by Mr. Hall, was in a terribly neglected state until he restored it to its full usage; the moon-ball was inoperative and the whole appears only to have been preserved as a curiosity. Unfortunately, certain features have been altered from their medieval condition, and repainting conveys an erroneous impression of the original appearance. Pl. LV, fig. 3, shows the moon-sphere clearly. The perfectly plain wooden dial, with its astronomical features in a square dial-case wholly renewed,

Fig. 1. Wells: 'Jack Blandifer'
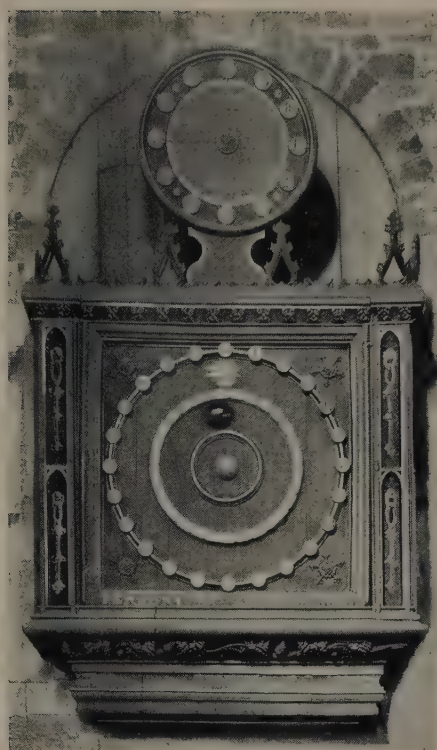
Fig. 2. Exeter: dials and dial case
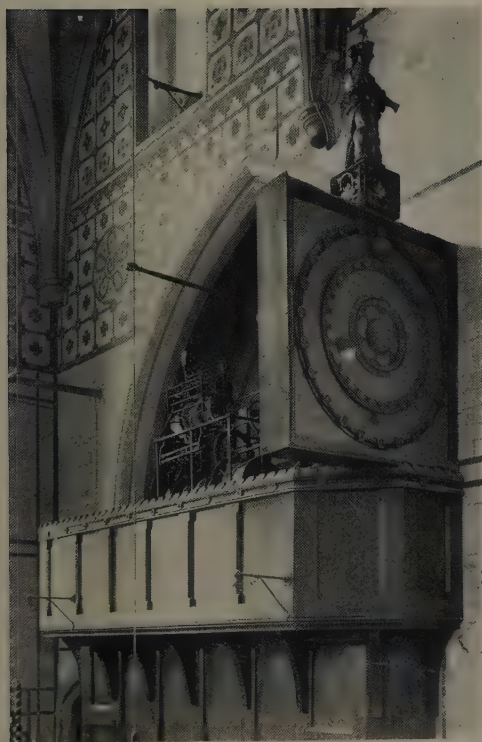
Fig. 3. Ottery St. Mary: the clock
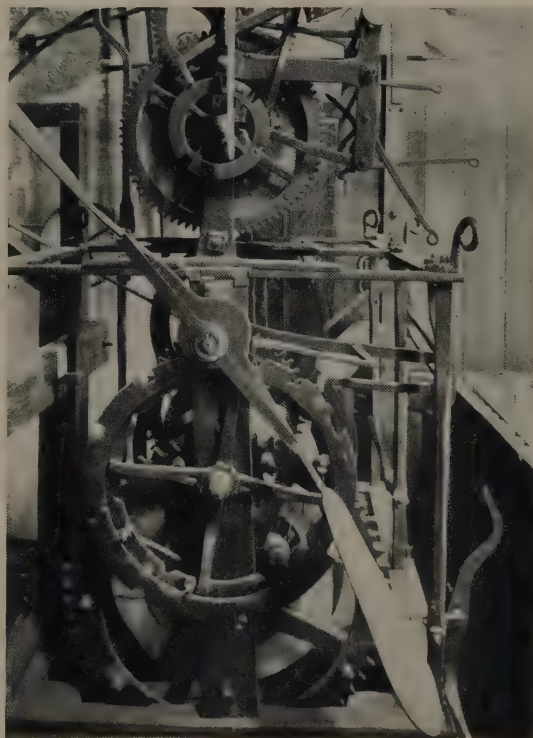
Fig. 4. Ottery St. Mary: the clock mechanism: striking and quarter chiming parts
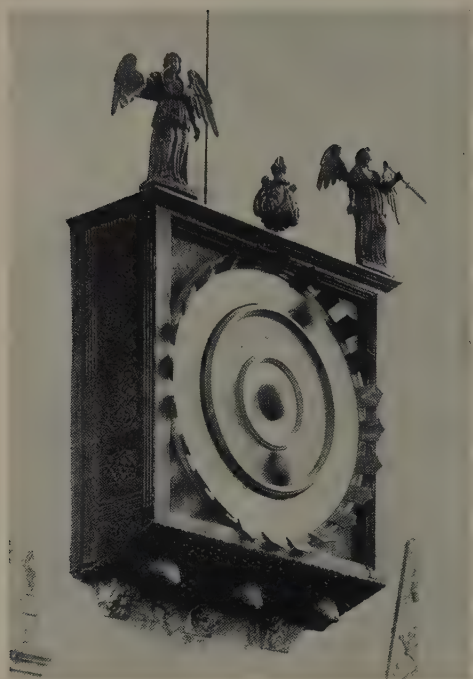
Fig. 1. Wimborne: dial and dial case

Fig. 2. Wimborne: exterior jack
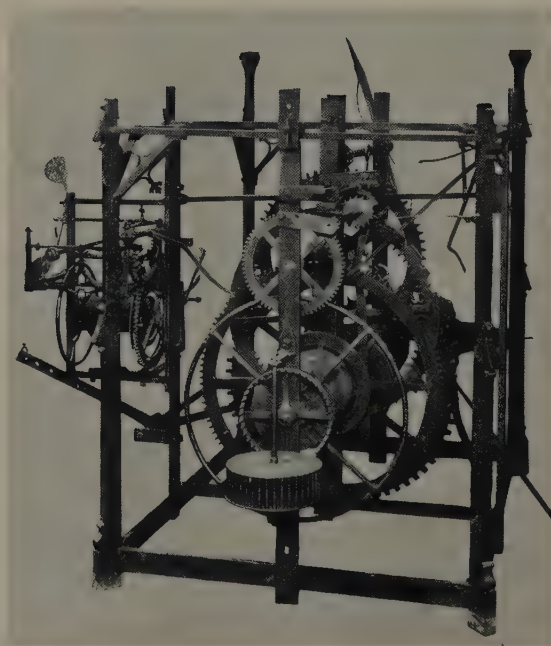
Fig. 3. Rye: clock mechanism

By permission of Messrs. J. W. Benson, Ltd.

Fig. 4. Rye: dial and quarter-boys

does not present the smallest detail providing an argument for the fourteenth century or any other date. As, however, the whole strongly resembles the dial parts at Wimborne, where there is clear evidence for the late sixteenth or early seventeenth century, one is most reluctantly inclined to assign both to that period. The lunation wheels, which may be older than the case, are interesting and ingenious, a peculiar feature being a pierced plate in which the teeth of the spindle carrying the moon-ball engage so as to rotate the moon-ball on its axis (pl. XLVII, fig. 1). This ball is painted half black and half silver, and as only a hemisphere is visible in the dial-plate, it appears to wax and wane once in the synodic period, during which it also rotates round the earth-ball. This feature also exists at Exeter and Wimborne, but the latter retains a pierced gear-plate exactly similar to that at Ottery. A gilt angel formerly in Lord Coleridge's library surmounts the dial-case, where it was placed under the impression that it was one of the two angels recorded as having formed part of the chancel fittings in Grandisson's original scheme; it is not of the Gothic period, but its rather clumsy pseudo-classical treatment is quite in keeping with the date to which I consider it belongs. It is misleading when made to appear as part of the clock.

THE WIMBORNE MINSTER CLOCK

The existing remains of the Wimborne clock, persistently assigned until a year or two ago to Peter Lightfoot, have a feebler claim to high antiquity than any other member of the west-country group, though the date, *c.* 1320, is still a matter of belief with many persons. I am unaware of any authority for such a date, which is unsupported by evidence in the present remains.

RECORDS

In a most interesting paper by our Fellow the Rev. R. Grosvenor Bartelot, (*Proceedings of the Dorset Natural Hist. and Antiq. Field Club*, Vol. XLVIII, p. 86), delightful extracts obtained by Canon J. M. J. Fletcher from Wimborne accounts are given. The first, dated 1409, is a payment to a carpenter for one *cofro pro la orloge* with lock and key. There are frequent payments to custodians and for repairs, keys, etc., during the fifteenth century and a clear distinction existed, as at present, between the *cloke* (movement) and the *horilog* (dial part). From Queen Elizabeth's time the dial part becomes the *Oryall, Oriell*, or *orrill*, a curious usage which has been confused with 'orrery' (a very late word) and means a loft, upper floor, or gallery. In 1593 is an all-important payment 'For removing the Cloke and the Oriell into the Spear xxs.', and though in the same year there is an item 'Layd out about the clocke and the Oriell' for which the charge is only vii*d.*, it is highly probable, in view of the workmanship of the

present carved dial-case, that this dates from the removal to the Spear (Spire, i. e. tower). There follow in 1594 numerous interesting items connected with the colouring and ornamentation of the dial with gold and silver leaf and vermilion. In 1612 various craftsmen are paid for carving the jack, for work on the chimes, etc. Both the dial and the movement were formerly elsewhere in the church, but were moved 'into the Speer' (see above) in 1593, the dial being erected on the south wall in the lowest story, about 15 ft. or 16 ft. from the floor-level. The movement, in a chamber above, is connected with the dial-case by an iron rod.

The Wimborne Mechanism

The framework does not follow the usual medieval plan, but consists of ten uprights forming an organized whole to include the going part in the middle, the quarter-striking part on the left, and the hour-striking part on the right. Four of the ten uprights are at the corners, the other three pairs being each used to support its own section of the mechanism.

This arrangement of the three parts side by side results in a large rectangular frame 66¾ in. long and 30¾ in. deep from front to back, the length being greater than that of any other clock here described. The assembled parts are secured by nuts and screws, as well as by wedges, and the screws are not particularly primitive, the bolts being approximately $\frac{5}{16}$ in. in diameter, and the nuts 1½ in. square. From the central hole in each nut four sloping channels are chased down to the four sides. These channels, which are of rectangular section, are shallow near the hole, and deeper towards the edges. There is no departure from the plainest use of bar- and strap-iron except in two cases, the first being that of the uprights, some of which widen gradually towards the bottom, the contour being gently curved. The second case is that of the finials at the four corners. These are of sheet-iron beaten out and cut into four leaves which are turned up to form crude four-petalled lily-flower ornaments, the central parts being drilled and threaded, so that the flowers form nuts for the four corner-standards. These floriated nuts are without elegance, and neither they nor any other parts of the mechanism have any feature which suggests the medieval period. Mr. W. B. Kerridge, the able clockmaker who has so carefully repaired and tended the clock, tells me that he has examined it carefully and cannot find any trace whatever of adaptation from a foliot-balance. If, as seems almost certain, there never was such a balance, the whole mechanism may be said at once to belong to the latter part of the seventeenth century or later, a conclusion which seems quite in keeping with its general appearance. The prearranged inclusion of quarter-striking mechanism as part of an organic whole makes the date 1320 extremely unlikely, while the screws, the workman-

ship, and the ornament render it merely ridiculous. The three great wheels are squared on their arbors and keyed through slots therein, a feature put forward by Mr. J. J. Hall in support of the antiquity of the Ottery work. This would be an argument rather for the lateness of the Ottery mechanism, Wimborne being beyond all doubt a specially late example.

THE WIMBORNE DIAL AND DIAL-CASE

To the casual observer the dial-case, which is about 5 ft. 10 in. wide, would probably appear as a far more convincing antiquity than that seen at Ottery St. Mary, for it rests on three early stone corbels which are let into the wall, and appear so suitable that they might have been made for the purpose (pl. LVI, fig. 1). They are, however, of Norman or Transitional Norman workmanship, and closely resemble in sculptural treatment the Transitional work in the nave. In the middle is a grotesque head, on the left is a twelve-leaved daisy-like flower, and on the right a rude ten-leaved device of classical origin, the outermost leaves being turned in typical Romanesque volutes. The lower part of the clock-case nearest to the wall is horizontal, and rests on the corbels, but in front of these it slopes upwards and outwards, the sloping part having three gilt cherubs attached to it, one in front of each supporting corbel. These cherubs again have a most misleading appearance, as the central head looks forward, while those on either side are slightly turned inward towards the central cherub, the wings of which are somewhat more open and suggestive of flight. The symmetry of this arrangement might lead the observer to consider the cherubs to be part of the design, but they came, in fact, from the organ case and have nothing to do with the original clock. As in the case of the angel at Ottery, they are not very greatly out of keeping with the real date of the clock-case. The same remarks apply to two angels standing on the top of the clock-case at either side. Between them has been placed, at some time, a hideous gilt finial, the antecedents of which were sufficiently Gothic to enhance the vulgarity of its pseudo-classical lumpiness. Its presence is at once an impertinence and a temptation to the intelligent visitor who can obtain a sufficiently long pole. The angels and finial should, I think, be carefully removed, but the cherubs should perhaps remain if they cannot be removed without leaving scars.

The clock-case proper is of wood, and is well and richly carved, though this fact seems to have been overlooked by persons who frequently see it, so dark is the woodwork and so poorly lit the space under the tower, even on the brightest day. The carving, easily examined through glasses in bright weather, is most characteristic, and it is little short of amazing that the early dating of the work seems to have passed without serious challenge for so long. The bottom part is well moulded in the Renaissance Classic style, and the side panels have

vertical classical fluting enclosing a species of flat relief-carving very familiar to all students of panelling and furniture near to the date 1600 (fig. 4). A typical and very similar example exists in a chimney-piece from Lime Street in the City of London, now preserved in the Victoria and Albert Museum; its date is *c.* 1620.

 The drawing given may be taken as a fair representation of this relief-work, though it is not claimed as accurate, the sketch having been made rather hurriedly from what could be picked out with glasses from below. The photograph shows the work moderately well, but has lost much in the processes of intensification that made it possible to emphasize this detail at all satisfactorily.

 The astronomical dial as it is now seen has the Earth at the centre within a ring. Outside this ring is an annular space painted blue to represent the firmament. This ring or moon-disc rotates round the earth-ball, carrying with it the moon-ball, which also rotates about its own axis and is half gilt and half black, so as to wax and wane exactly as at Ottery St. Mary. At 90° and 180° from it are six-rayed stars, and the intervening blue surface is painted with smaller stars, apparently disposed so as to represent constellations, Ursa Major being easily identified. Outside this is an annular space over which travels the disc representing the sun. Beyond this again is a ring of twenty-four tablets on which the hours are represented in large gilt Roman numerals, with the exception of midday at the top and midnight at the bottom, where Maltese crosses are used. The outermost ring, painted blue, has a surface which slopes inwards towards the centre of the dial, so that it is part of an imaginary cone having its apex behind the dial. The angle is about 45°, so that the horary tablets which are attached to the surface are inclined at that angle to the plane of the dial-plate.

Fig. 4. Wimborne: ornament of sunk panelling on east side of dial face.

 I have not had opportunity for examination of the interior of the clock-case, but have learnt from Mr. Kerridge that it contains a pierced gear-wheel in the lunation mechanism, exactly similar to that remaining at Ottery, and that a nineteen-barred lantern-pinion, of the type which it is presumed existed at Ottery, remains at Wimborne. It is possible that the dial with the lunation gearing behind it is earlier than the dial-case, which is undoubtedly Elizabethan or Jacobean and is likely to have been made in 1593, when the clock was moved, but there is no satisfying evidence that anything connected with the Wimborne clock belongs to an earlier period. The great similarity in general arrangement and in dial-mechanism between the dial parts at Wimborne and Ottery strongly suggests contemporaneous work, and it seems reasonable to

assign both to about 1593, while admitting the possibility of a much earlier date for the lunation and dials. The Ottery mechanism may be Elizabethan, but I am inclined to think it a little earlier.

THE WIMBORNE JACK

A jack was carved at Wimborne in 1612. This date cannot be accepted as applying to the existing jack, of whom it is said that 'His *present dress* is that of a British Grenadier about the time of Napoleon' (pl. LVI, fig. 2). The fact appears to be that he actually belongs to about the time of Napoleon, and Mr. P. G. Trendell, with our Director, concurs in this opinion. The cut of the jacket and hat cannot have been altered from the dress of an earlier period and are definitive. In his present colouring, this jack, who is about 5 ft. high, has a red coat with white facings, white breeches, and black boots up to the knees. His cocked hat is of the 'beadle' type, he has a bandolier or strap across his coat from the top right shoulder to the bottom left, and a red tassel hangs down over his left leg. The quarter-bells are struck by hammers, not held by the jack, who now merely moves his arms (right arm first) when the hammers deliver their blows.

THE RYE CHURCH CLOCK

The movement at Rye has been said to be the oldest clock in England still at work with its original mechanism; it is also said to have been purchased by the churchwardens in 1560, to have been taken from an Armada ship and presented by Queen Elizabeth, and lastly, to bear such close resemblance to the Wells mechanism as to be probably traceable to the same workshop and perhaps to the same artist! Of these statements only the first appears to be true, and the last is a bare possibility with scarcely anything to support it. If the clock came from the same workshop as the Wells mechanism, this must be presumed to have remained in being for about 120 years, the approximate period which seems to have intervened between the making of the two movements.

RYE RECORDS

In the churchwardens' accounts for 1515:

For working upon the frame of the clock and dial in the steeple 2s.
(1516). 'The man who made the clockwork and dial £2 6s. 8d.'
'The man of Winchelsea that made the clock, in full payment of his bargain 6s. 8d.'

We may suppose that the 'full payment' means the clearing of an outstanding account of 6s. 8d., and that the existing ironwork is in greater part the identical clock to which the documents refer, as the ornament is quite in

keeping with that date.   Captain L. A. Vidler, of Rye, has kindly furnished other documentary references of which only the more interesting are quoted :

Dec. 18, 1561. 'Paid to Mr. Lewes in parte payment for the Clock iii£.'
Dec. 19 and 20.   'To Holbrock and Long to make the frame the Clock Standith on etc. ii days apiece iiii s.'
Dec. 24. 'P'd for Peter Glacier for casting the grete waite for the Clock and stopping ii holes in the lede ii s. viii d.'

These references are interesting as showing the probable origin of the legend of a purchase by the churchwardens in 1560.   The payment to Lewes was doubtless for repairs, and to Holbrock and Long for a 'horse'.   There are important payments for the making of the 'house over the clock' in 1561–2. The whole expenditure between 1561 and 1563 is £33 16s. 6d., a large sum.

The Mechanism at Rye

There is, as the late Mr. Octavius Morgan pointed out in 'Notes on the Ancient Clocks at Rye and Dover', considerable resemblance in 'size, form, plan construction and arrangement' to the Wells ironwork, but his belief that the two may be contemporaneous and possibly even by the same artist is untenable if we accept the date *circa* 1392 for the Wells clock, as that at Rye has essential details which are far too late, quite apart from the fairly satisfactory documentary evidence for a sixteenth-century origin.   It does not seem necessary to consider seriously advancing the estimated date of the Wells mechanism to satisfy the theory, as the architectural difference is quite sufficiently marked, and such ornament as remains at Wells would suggest late fourteenth rather than early sixteenth century.

Many interesting details are given in Mr. Morgan's article, and the following are mainly facts and suggestions which, to the best of my belief, have not hitherto received publicity or are not generally known.   The corner standards carry out the diagonal buttress idea more fully than in any other example, as each has, in addition to base mouldings, two groups of set-off mouldings, one half-way up, and the other on a level with the top horizontal bars of the frame (fig. 1, and pl. LVI, fig. 3).   The standards are continued above the frame in very graceful square-sectional form which gradually contracts and then expands into beautiful finials, having divisions on each face, and projecting top mouldings almost suggesting battlements.   Unfortunately, two of the finials have been sawn off.   Mr. H. A. Sandford, pointed out to me that a similar and smaller finial, elsewhere in the ironwork, had a small pyramidal cap, making a far more satisfactory finish; he further discovered that the corner standards had central holes in which it is likely that similar pyramids were formerly fitted.   A large and small finial, with and without the top piece, appear respectively in pl. LVI,

fig. 3, and pl. XLVII, fig. 2, *d*. The set-off mouldings, which are of great beauty, clearly belong to the late Perpendicular style, and are similar to those in some ironwork at South Kensington, generally attributed to the early sixteenth century. The uppermost moulding in both the base and set-off series is quite of fourteenth-century type, and our Director, on seeing the profile illustrated in fig. 1, said that by itself it would suggest the earlier rather than the later period. This shows what caution is necessary in using early details as proof of early date, rather than using late details as proof that work cannot be of early date, a method that is safe, and in this case brings the Rye clock into harmony with its records. In the angles between the corner uprights and the top horizontal bars are diagonal struts of iron; and beautiful foliated cusps of later type and greater elaboration than those at Wells fill the triangle between these and the main bars. The tops of the intermediate uprights are embattled and cut in criss-cross pattern exactly as at Wells. There are no other special evidential features except that the going-part still carries the four winding arms of the ancient capstan arrangement, though they were subsequently connected by a light circular rim which gives them the appearance of wheel-spokes. This feature is important and interesting as it provides evidence that the arrangement is not a sign of high antiquity.

Needless to say, the methods of fastening are similar to those at Wells, and though the clock belongs to a period when the screw as a fastening was beginning to be well known, no contemporary screws are to be found here. The quarter-chiming movement is said to have been added in the eighteenth century, and though the style of ornament is admirably harmonized with that of the ancient part, there is no reason to doubt the statement. This part is carried on brackets on the east side of the frame.

It is impossible to say at what date the remarkable pendulum was substituted for the foliot-balance; it is very long and hangs down in the church, where it swings at the slow rate of twenty-five beats to the minute. During the repair and cleaning carried out by Messrs. J. W. Benson, of Ludgate Hill, in 1925–6, the heavy bob was found to be attached only by a few rusted screw-threads; it bears the name and date 'R. Gill, 1810'. Captain Vidler says that the Gills were a Rye family of clockmakers. Three lantern-pinions and certain small parts that have been replaced by Messrs. J. W. Benson, Ltd., will, it is understood, be preserved carefully in a local museum.

Dial and Quarter-boys at Rye

The quarter-boys on the north face of the tower are about 4 ft. 7 in. high. They are hinged at the elbows and hold short thick bars for striking the bells, which are sounded only at $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$, and not at the hours (pl. LVI, fig. 4).

The architectural treatment of the dial and the sculptural style of these gilt figures are typical of the eighteenth century. The classic mouldings and volutes, the debased vegetation, the vulgarly-framed shield and the bloated boys, are all so bad as to be beyond criticism, and so amusing and delightful in their quaint command of the narrow street, that the lover of this beautiful town who does not look forward with pleasure to each fresh view of them must be a very exclusive purist.

The Southwold Jack

The famous fifteenth-century clock-jack at Southwold is a very fine example of sculpture and painting and all knowledge of its colours had been lost until 1925 when, having rediscovered them, I removed the black coating of dirt on the face and some other parts. Full descriptions of this and other ancient clocks and jacks are in progress in the *Horological Journal*. It is to be hoped that the work at Southwold will be completed, as I believe that fine colours remain beneath paint on the armour.

Unique miniature jacks (*circa* 1500) from which I had removed three coats of paint were exhibited at the meeting.

CONCLUSIONS

1. The existence of escapement clocks in Europe prior to the early part of the fourteenth century is doubtful, the first reasonably satisfying references being in Dante's *Paradiso*, 1318–21, and in Fiamma's account of a public clock at Milan in 1335 (see Baillie).

2. Mr. G. H. Baillie's investigations seem to indicate roughly a progression of public escapement clocks across the Continent between *c.* 1336 and *c.* 1371.

3. No *certain* evidence has reached me as to the nature of the horologes on the Continent before *c.* 1318, nor as to those in England before *c.* 1368. They may have been clepsydrae.

4. A cluster of records appearing first (so far as I have yet ascertained) at Exeter in 1284 suggests the rise of a new invention or the sudden popularity of some existing device at the end of the thirteenth century. The St. Paul's deed and the St. Albans records give some support to the theory that genuine clocks were known in the thirteenth century. We must not yet dismiss the possibility that the escapement was actually an English invention of the thirteenth century, though it seems unlikely.

5. Certain of the earlier horologes, which appear to have been magnificent and elaborate, may have been clepsydrae, and the transition to weight-drive may have been gradual, but the origin of the escapement remains obscure.

6. The functions of clocks were gradually increased and made more complex probably in the order already given.

7. The escapement clock may have appeared in England simultaneously with the importation of three Dutch horologers in 1368, and the appearance of the word 'clock' almost immediately afterwards supports this view, but see 4 above.

8. In my opinion only the Dover Castle, the 'Webster', and the Peterborough clocks leave room for any belief that there is any fragment of a clock in this country which is earlier than *c.* 1390, and these contain no feature that definitely supports the claim; they merely remain doubtfully challenged because of their lack of evidential features.

9. Of the other important existing examples, the oldest and finest is that at Wells (*c.* 1392). Next in order are probably Exeter, partly fifteenth century; Ottery, perhaps sixteenth century with one or two earlier wheels; and Wimborne, the last being, in the main, late sixteenth century and after.

10. Wells probably has the oldest jack and the oldest pair of quarter-jacks.

11. The mechanical details formerly considered to be guides to antiquity are almost all valueless, though architectural detail in ironwork is of high importance.

12. The presence of screws and nuts precludes a date prior to *c.* 1460, and is generally a sign of sixteenth-century or later workmanship.

I have to thank many persons whose names appear in the text, but especially our Director, Mr. Peers, Dr. J. Armitage Robinson, Mr. Eric Millar, Mr. J. H. Garside, Mr. G. H. Baillie, Mr. J. J. Hall, the Rev. R. Grosvenor Bartelot, and Captain L. A. Vidler, in connexion with documents and other matters. For various help, especially in the actual examination of clocks, I am most grateful to Mr. G. L. Overton of the Science Museum, Mr. Percy Webster, Mr. H. A. Sandford, and to the clergy and custodians of the four west country clocks and those at Peterborough and Rye.

My indebtedness to several owners of photographic copyright is made clear beneath the illustrations, but I wish to refer especially to the kindness and courtesy of Dr. Paul Weber, of Jena.

DISCUSSION

Mr. MILLER thought the Rye clock later than the others, as its moulding appeared in sixteenth-century domestic clocks of Gothic character, and he had seen an example dated 1506. Iron clocks of the sixteenth century were always painted, never engraved, and he had noticed traces of paint on them. In the famous picture of Sir Thomas More's family one of these painted Gothic clocks was seen high on the wall, as the weight fell six inches every hour. The clock described by Froissart tallied with that at Dover, but he said the clock revolved in

twenty-four hours. None had come down to the present, but representations were seen in Italian intarsia work of the fifteenth century, and there was one in the great church at Assisi. The curious clock at Nuremberg was of more primitive construction, and the dial ran up to sixteen, the number of hours in the longest summer day and winter night. At the top was a long projecting point : there was no striking train, but a little alarm released at each hour. A watchman would feel the point during the night and strike the hour.

Mr. OVERTON answered the question with regard to the Dover clock, which had a drum of 7 in. in diameter, and 40 ft. of chain was required for one day. At the Science Museum there was a fall of 3 ft. of chain every two hours.

Mr. BAILLIE said it was satisfactory to find some one engaged in research on English clocks, as the subject had been neglected in the past, and the author had done well to explode the very early dates assigned to cathedral clocks. Those alleged to date about 1300 were found to be at least a century later. He hoped to show that the Dover and Wells clocks were the earliest in existence, the only other one with any claim being that in the Germanisches Museum at Nuremberg. The earliest mention in any of the rolls dated the Dover clock about 1400, and he had found that in the five years including 1348 bells were fixed in the tower at Dover, which might account for that date being given to the clock. Dover could hardly be earlier than 1370, and he was of opinion that there were no clocks in England before the three Dutch clock-makers were brought over. Attention should be drawn to the neglect of clocks in cathedrals and churches. At Tewkesbury he had found one with a carillon of sixteen bells stowed away in a loft, though in reasonably good order.

Mr. HOPE JONES had found the paper fascinating, and had known the author's skill and patience for many years, but the present was the first opportunity he had enjoyed of listening to the whole story. Dr. Gunther, of Oxford, had been obliged to leave before the discussion opened.

Mr. PERCY WEBSTER agreed that the west country clocks were later than the fourteenth century, at least as far as the movements were concerned.

The PRESIDENT expressed the Society's indebtedness for a paper of much interest, and was himself more drawn to the figures than to the mechanism. Notice would be taken of the warning with regard to the Tewkesbury clock. The moving figures, being secular work, were not subject to persecution, and he recalled the artistic specimen at Southwold. Such things were naturally repainted from time to time and might assume the garb of popular heroes : their date should not be estimated by their present appearance.

XII.—*The Decoration of the Beauchamp Chapel, Warwick, with special reference to the Sculptures.* By Philip B. Chatwin, *Esq.*, F.S.A.

Read 17th February 1927

So much has been written about the Beauchamp Chapel that it is impossible to give any description without repeating more or less well-known facts, but with the exception of the glass, which in part was dealt with very fully by Dr. Hardy in 1909,[1] writers have been content to generalize with regard to its detail; though J. G. Waller, writing on Christian Iconography in the *Gentleman's Magazine* in 1850 and 1851, used figures from the mullions of the east window to illustrate his subject.

During the winter of 1925–6, various repairs were made to the interior of the building necessitating the erection of a scaffold, and opportunity was then taken of making a close study of the statuary and other carving with which it is enriched.

The chapel was built in accordance with the will of Sir Richard Beauchamp, Earl of Warwick, which will was made in 1437 two years before his death. The part with which we are concerned reads:

I will, that when it liketh to God, that my Soule depart out of this World, my Body be enterred within the Church Collegiate of our Lady in Warrwick, where I will, that in such Place as I have devised (which is known well) there be made a Chappell of our Lady, well, faire, and goodly built, within the middle of which Chappell I will, that my Tombe be made; . . .[2]

There were seven executors named in the will, but those who interested themselves in the building of the chapel were Thomas Huggeford, one of the Earl's Council and plainly his right-hand man, Nicholas Rody, his steward, and William Berkswell, priest, dean of the collegiate church of St. Mary in Warwick. The contracts for the making of the tomb and for various embellishments and fittings of the chapel were in existence about the year 1820, when they were copied by Captain James Saunders, and about the year 1840 were printed by John Gough Nichols.[3] Dugdale had printed the greater part of the matter in his *Antiquities of Warwickshire* but in abbreviating had left out several points of

[1] *Archaeologia*, vol. lxi, 583.
[2] Appendix to John Ross's *Historical Account of the Earls of Warwick*, by Thomas Hearn, 1729.
[3] *Description of the Church of St. Mary, Warwick, and of the Beauchamp Chapel.*

interest. Nichols also printed the summarized accounts made by Dean Berkswell, which run from the year 1442 to 1463, also from the copies of Capt. Saunders.[1]

These contracts and accounts show that, in accordance with the terms of the will the chapel was 'well, faire, and goodly built', and it is evident that the craftsmen employed were the very best the executors could find.

A little to the east of the centre of the chapel is the monument of the founder, that magnificent object so often described, with its elaborate Purbeck marble tomb-chest, with its bronze angels and weepers on the sides, and carrying the life-size figure in bronze of the earl.

In medieval times the whole of the seven large windows would have been full of magnificently coloured stained glass with figures of saints and angels, the apostles and prophets, and other subjects to give honour to the Blessed Virgin, and with these were associated the carved figures with which the mouldings of the great east window are enriched. These images have been preserved in an almost undamaged condition ; and they are among the most beautiful examples of English craftsmanship of the fifteenth century which have come down to us. They were re-painted rather over a hundred years ago with such sympathetic feeling that there is little with which to find fault, and there is a strong probability that the original colouring was followed as far as possible.

The central figure at the point of the four-centred arch of the east window represents the Almighty, and grouped in the mouldings are figures of the heavenly hierarchies, and of four female saints, together with angels holding shields on which appear the coats of arms of the Beauchamp family and its connexions.

The good quality of the workmanship of the figures is most marked.   The authors of *Medieval Figure-Sculpture in England* have shown that in all probability the craftsmen who were responsible for these statues were the same, or at any rate from the same shop, as those who made the patterns for the bronze figures on the tomb-chest.   The details of the contracts for making the tomb are still in existence, but, unfortunately, there is no documentary evidence for the making of the imagery round the windows.   The above-mentioned authors suggest that the well-known 'marbler' John Essex of London, who was associated with William Austen the 'founder' and Thomas Stevyns the 'coppersmith' in the making of the 'hearse', the bronze plate on the top of the tomb-chest and the bronze strips with the inscription, was the master mind, another 'marbler' John Bourde, of Corfe Castle, being responsible for the Purbeck marble tomb-chest and the paving of the chapel.

In the summarized building accounts which remain there is an entry of 1447, the sixth year of the chapel's building, in which year the main plumbers'

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[1] Now preserved in Shakespeare's Birthplace Library, Stratford-on-Avon. The originals are apparently lost.

bill was paid, showing that the chapel had just been roofed: 'In parte solucionis operacionis de Marbelar, 14*l.* 3*s.* 7*d.*' This payment was for stone carving, no doubt, but it may have been the finishing of the vaulting bosses. In the next two years there are minor payments to the 'marbler', but the main expenses in this direction are no doubt lost in the payments made in 1452 and four following years, when the total for each year is given with no detail.

It is important to realize the great care which was taken that the work should be of the best. The most highly paid of all the craftsmen employed was 'Bartholomew Lambespring, Dutchman', who polished, prepared for gilding and gilded the main bronze effigy and the small ones on the tomb-chest. Associated with him in the contract was William Austen, the founder, John Massingham, carver, of London, and Roger Webbe, barber. The inclusion of the latter is interesting as it once more shows what great care was taken to get the best results. Webbe was warden of the Worshipful Company of Barber-Surgeons of London in 1449: he was required, presumably, to look after the anatomical details, an unusual course to take at so early a date as the middle of the fifteenth century, but one which shows how exceptionally careful the executors were that the work in the chapel should be of the very best. No doubt the clearly defined veins on the back of the hands and on the temples are the result of the barber-surgeon's superintendence. John Massingham, described as 'Kerver, Citizen of London', was probably a worker in wood, and no doubt prepared the pattern of the main effigy. Whether he or some one else prepared the patterns for the weepers and the small angels we do not know, but the same feeling in the workmanship, the arrangement of the drapery and the flowers on the garments is apparent in the sculptures on the east window. Bartholomew was to receive for the various works he did on the tomb nearly 200*l.*, an amount which would represent thousands in modern money. He was by far the most highly paid craftsman, but the others were of no mean order. London provided all the other craftsmen of which we have record: John Prudde of Westminster, glazier to the King, for the glass, two London carpenters for the stalls and organ-loft, John Brentwood, citizen and steyner of London, for the painting of the Last Judgement, though first-class workmen were obtainable from Coventry only ten miles away. But superlative excellence was required such as might well be found in London only.

Whoever the craftsman was who executed the carving of the figures in the Beauchamp Chapel, it is plain that he was a man who knew his work. No doubt he had a plan prepared by some learned ecclesiastic—one pictures the dean himself—showing the arrangement of the figures and also deciding how the particular meaning of each figure should be indicated. To a certain extent, of course, the traditional method of representing the various attributes assigned to

the figures has been followed, but in many cases they are unusual, the wide variation adopted producing an exceptional result.

From the great care taken in arranging for all the other work in the chapel, one may rest assured that the planning of the scheme and all the details of its execution had every possible consideration and care, and it was not the case, as suggested by Waller, that the arrangement was not thoroughly considered. While trying to fathom the meaning of the arrangement of the figures one must bear in mind that each one was so placed as to convey a carefully reasoned story. Whenever a figure representing some particular order of angels is out of the position in which one would normally expect it, there can be little doubt that the modification is deliberate and made with some set purpose.

This wealth of imagery is contained in the two large hollow moulds forming the frame of the great seven-light window occupying the whole width of the east end of the chapel; the three lights in the centre being separated from the others by large mullions which have on each side hollows similar to and in continuation of the inner hollow of the frame (fig. 1). The outer hollow is 10 in. wide, the inner 7 in., and the height of the figures varies from 3 ft. to 1 ft. 9 in. They are sometimes actually rather wider than the hollows, overlapping the mouldings at the sides.

The central figure, crowning the whole scheme, is that of the Almighty (no. 1, pl. LVII, fig. 3): it occupies the two hollows and is set transversely to the others. It is under a canopy formed of the end central boss of the vaulting. This canopy has two cusped ogee arches terminating with a finial between the vaulting ribs and ornamented at the springing by a pair of small angels, one on each side and a boss of foliage in the centre. The figure follows the traditional method of representation, a venerable man, with long hair, moustache and beard, wearing a robe which almost covers the bare feet. From the shoulders hangs a mantle which is thrown back showing little more than a highly enriched margin. The right hand is raised, the left holds the sphere divided into three parts by a flat band round its middle, with another dividing the upper half from front to back. The figure is seated and is not crowned, but all round the head and sides there is a large aureole.

Of the thirty figures representing the Hierarchies of Angels, there are fourteen on the jambs and arch moulds and sixteen on the mullions: the latter are in duplicate, so we have, with different emblems, twenty-two (fourteen, and eight) to allocate to one or other of the Nine Orders described by Dionysius. These orders as understood in the Middle Ages are perhaps best set forth in Caxton's *Golden Legend*, in the pages devoted to the Feast of St. Michael the Archangel.[1] He says:

For the sovereign Gerarchia after the assignation of S. Denis containeth Cherubin,

[1] *The Golden Legend as Englished by William Caxton*, Temple Classics, vol. v, pp. 184–7.

Fig. 1. The central group

Fig. 2. Back of a censing
angel, No. 31

Fig. 3. The Almighty, No. 1
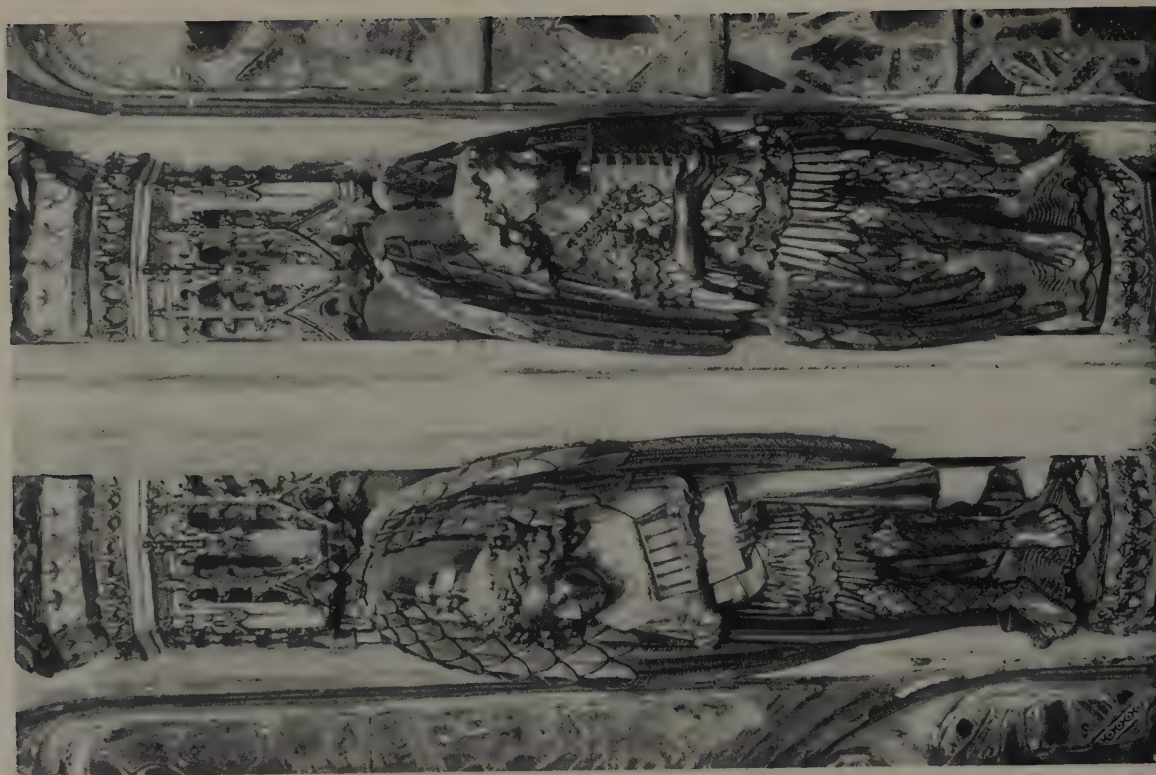
Fig. 2
Dominations, Nos. 36 and 37
North Mullion

Fig. 1   Seraphim, No. 33
North Mullion
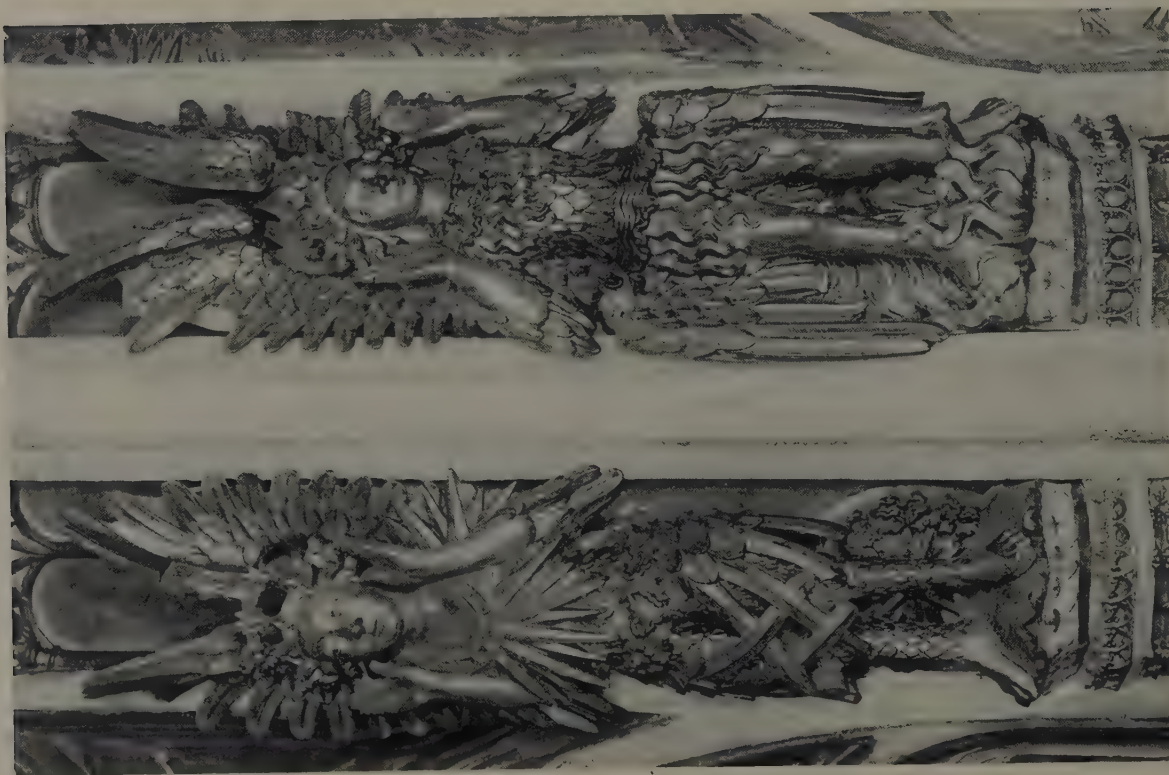
Cherubim, No. 32

Fig. 2
Virtues, Nos. 44 and 45
North Mullion
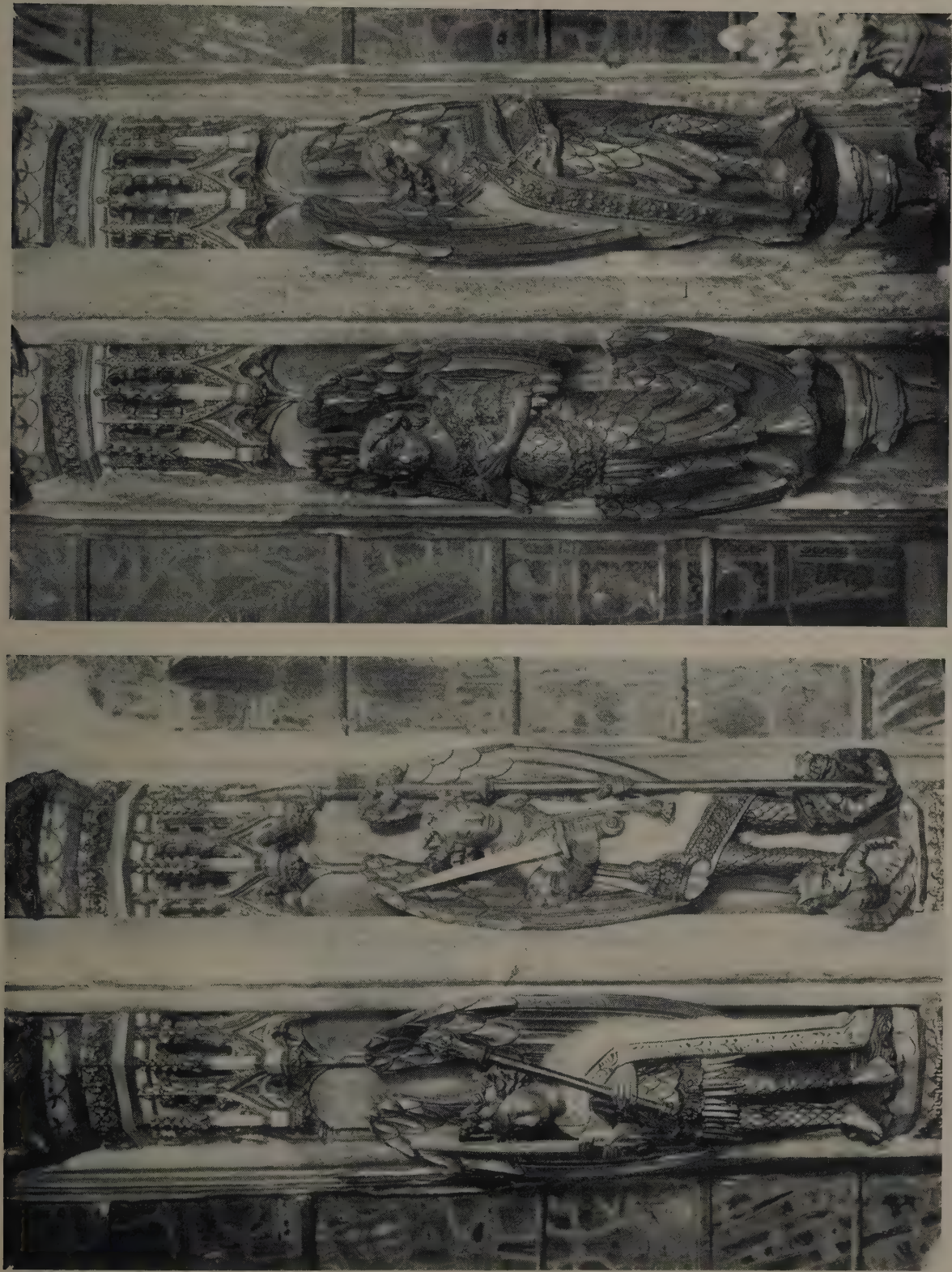
Principalities, No. 42   Fig. 1   Powers, No. 43
South Mullion
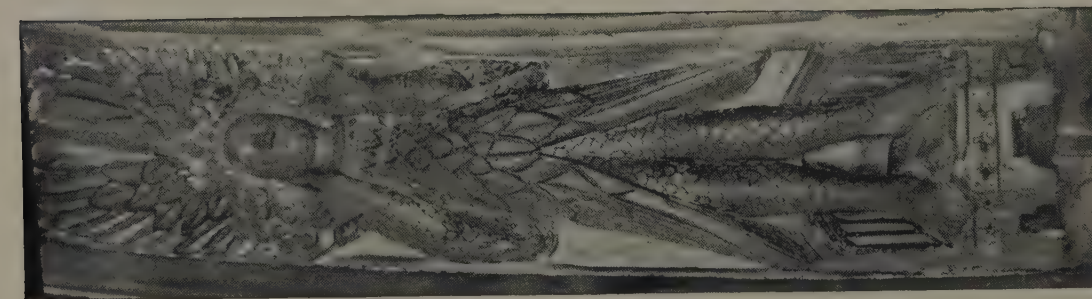
Fig 4
Dominations, No. 21

Fig. 3
Powers, No. 20

Fig 2

Fig. 1   Thrones, Nos. 18 and 19
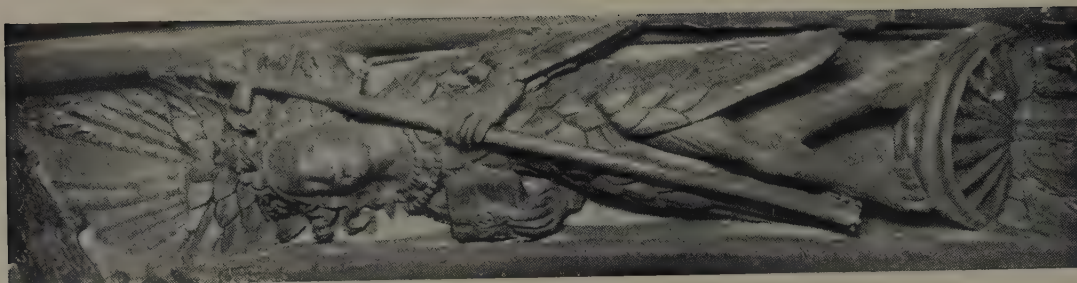
Seraphin, and the thrones: the middle containeth the dominations, the virtues, and the potestates; and the last containeth the principates, angels, and archangels.

The scheme was constructed from St. Paul's words in his epistle to the Colossians (ch. 1, ver. 16): 'In Him were all things created in heaven and on earth,
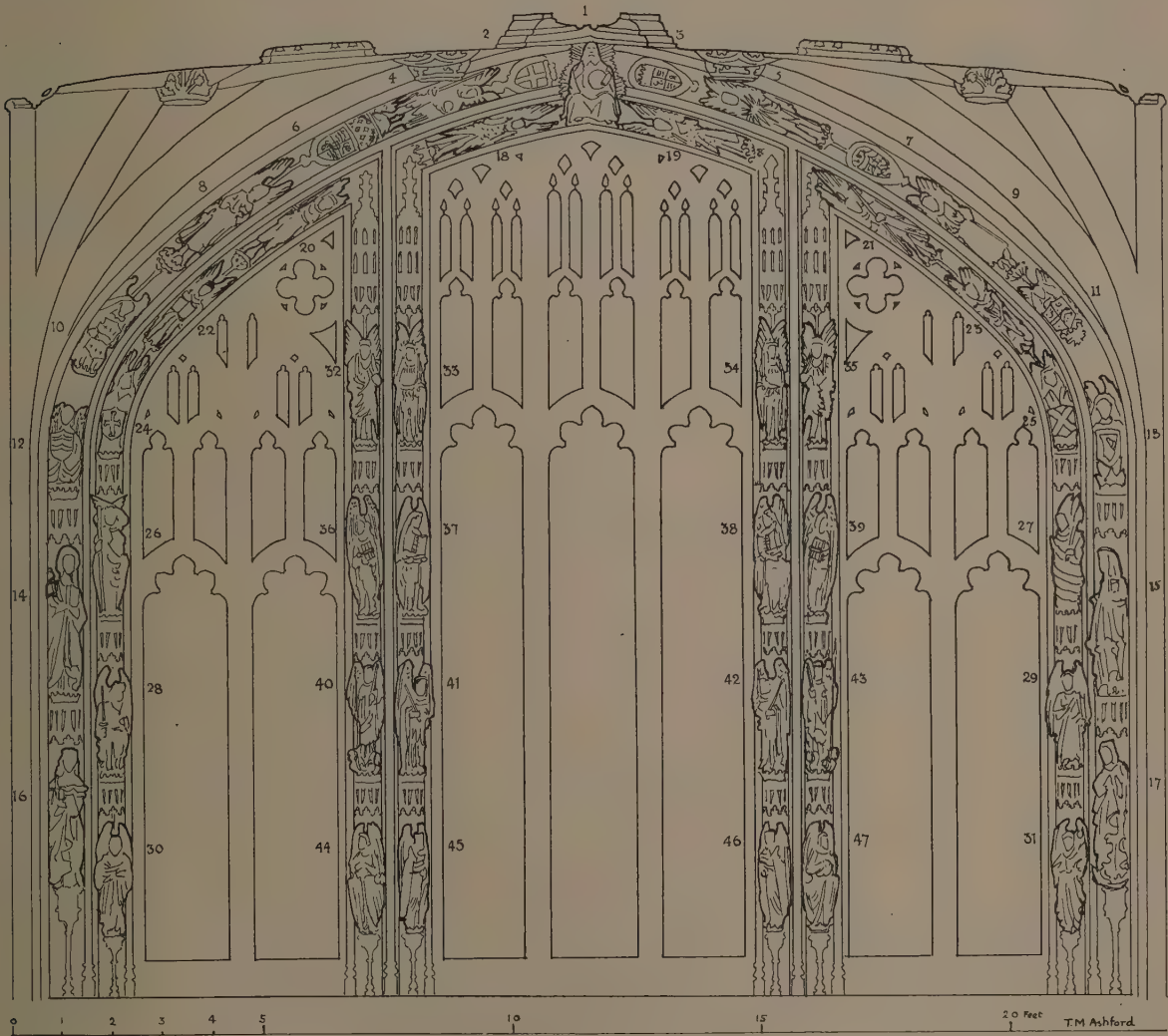
Fig. 1.   Diagram of the east window of the Beauchamp chapel.

visible and invisible, whether *thrones or dominations or principalities or powers*'; and that to the Ephesians (ch. 1, ver. 21, to quote this time from Wycliff's translation): Christ is raised above 'ech prinicipat, and potestat, and vertu, and domynacioun'.   These combined make five, and the nine is made up by the addition of Seraphim and Cherubim, Archangels and Angels.

In construing the meaning of these figures one naturally turns to medieval examples where the nine orders of angels appear with labels attached, as in the tracery lights in the chapel of New College, Oxford, or at St. Neot church, Cornwall, or on the screens in Barton Turf church, Norfolk, and Southwold, Suffolk, and the like. Several of the Warwick figures bear distinct resemblance to these examples, but in some cases it is impossible to be absolutely certain of the meaning. They are therefore classified in the way I believe to be correct, and I submit it with the greatest diffidence. The author of the scheme plainly was a theological student who, in his composition, besides adopting traditional symbols, added others which, if not actually original ideas of his own, were not in common use by the artists of the day. With regard to the identification of some of these I should like to record my great indebtedness to our Fellow Mr. G. McN. Rushforth, who has given me the greatest assistance. I must also gratefully acknowledge the help received from the Provost of Eton, and from Mr. F. T. S. Houghton and others.

The first and the third hierarchies are comparatively easy to recognize, each having two figures in their three orders, but the second is much more difficult to understand as great freedom has been taken in the representations. Why certain of the orders should be represented in the way they are it is hard to say, and often to our way of thinking the allusion is far-fetched. The book of Revelation is frequently used to supply illustrations, and again references in the book of Daniel and other of the Old Testament prophets give parallels. Some of these references can be found to have been made by medieval commentators, and no doubt there are others.

The first of the hierarchies is represented by six figures, two of each order in close proximity to the Almighty: the Seraphim and Cherubim at the top of the mullions, that is *in front*, and Thrones close at the side in the inner arch mould. The second hierarchy begins at the top of the outer arch mould, but separated from the central figure by shields. The first is Dominations on the south side with a companion figure of the same order close to it in the inner hollow. That these are meant to be taken together is shown by the fact that the corresponding pair on the north side are both Powers, there being no difficulty in their interpretation. Below these, in the inner mould, there are angels again apparently representing Dominations, one each side, and the same order comes again at the second tier of the mullions. Virtues are opposite one another in the outer moulds. Below this point there is on each side a group of three angels holding shields, which divides the second from the last hierarchy as represented in the arch moulds. At the bottom of the mullions are figures of Virtues, and on the tier above them are brought together Principalities from the last hierarchy and Powers from the middle, a most obvious pair, for they

are hardly ever mentioned apart in the New Testament. The last hierarchy on the window jambs has a pair of figures opposite one another representing Archangels, and beneath each are the final Angels.

At the bottom in the outer hollow moulds of the jambs are four female saints; St. Barbara and St. Catherine on the north side, and St. Mary Magdalen and St. Margaret on the south. By them in the inner mould is a pair of censing angels.

The first hierarchy contains the three orders of angels which are continually in the presence of God and whose special duty it is to offer the never-ending praise; consequently we find their figures at Warwick all represented, as they are most usually found, with their hands raised upwards in the act of adoration. In Queen Mary's Psalter in the British Museum they are all so distinguished, even though Thrones is in the third place in the second line. At Warwick they are placed as close to the Almighty as could be managed.

The two figures of the Seraphim (nos. 33 and 34, pl. LVIII, fig. 1) are on the inside at the top of both of the mullions: they, like all the figures on the mullions, are replicas of each other except for their position being reversed; for instance, if on the north mullion an angel is holding a sword in the left hand, the corresponding figure on the south holds it in the right. The Seraphim have feathers on the body and arms; round the neck is a band of conventional 'clouds' on which are flower-like stars, and round the waist is a girdle of wavy lines apparently meant to represent water. From the 'clouds' and the girdle hang flames; the hair is flame-like and the bare feet and legs are surrounded by flames. There are wings extended above the head and behind the legs.

Flames are the usual attribute of Seraphim: at both St. Michael's Spurriergate, York, and St. Neot church, Cornwall, the Seraphim of the Nine Orders are shown in the windows as standing in flames; but to represent them as clothed in flames is unusual.

The other pair of figures on the top of the mullions represent Cherubim (nos. 32 and 35, pl. LVIII, fig. 1); they are feathered on the body, arms, and legs, with the hands raised; round the neck is a ring with long rays set all round it like a large pierced star, there is a girdle of 'clouds', and the feet, which are bare, stand on 'water'. Behind the feet is three-quarters of a circle of clouds round a large star forming a kind of wheel, presumably the 'wheels' mentioned in Ezekiel x, in connexion with Cherubim. On the head is a crown, the points of which terminate in star-shaped flowers. There are two pairs of wings, one pair extended above the head, the other covering the legs where the long quill feathers are separated, and cross over one another in an unusual manner. The star as an attribute of Cherubim is not altogether common, but it is seen in the rayed crown worn by the Cherubim on the screen in Barton Turf church,

Norfolk, and seems to have the same meaning in a description of the Order by John Colet (1467?-1519), Dean of St. Paul's, when writing on the Celestial Hierarchy of Dionysius, that 'in the second place are the Cherubic Spirits; most glorious beings of light, shining in nature, beyond aught that can be conceived, with the multitudinous wisdom of God. . . . The first (Seraphim) subsist by their fire of love, so the second by their light of knowledge.'[1] Also in Stephen Batman's version of Bartholomew Glanville's thirteenth-century encyclopaedia we find:

> For the beame of the lyght of God, shineth principally in the Angells of this order, . . . For the lyght of wisedome, that they receive largelye, it passeth by them, to divers others. For the fulnesse of lyght that they receive, they give forth and commit to other.[2]

The Cherubim, like most of the angels, stand on what at first sight might be taken to be 'clouds', but when 'clouds' are represented, they may be recognized by a plain surface with *nebuly* edges in the usual manner, while these pedestals are covered with a series of wavy lines like those seen in representations of water both in carvings, such as in the frieze of ships on Tiverton church parapet and elsewhere, and in pictures in medieval MSS. It is true the curly edges are much like the edges of the 'clouds', but the wavy lines seem to suggest something different, apparently 'water'.[3]

The figures representing Thrones (nos. 18 and 19, pl. LX, figs. 1 and 2), the third order of the first hierarchy, are in the inner hollow, immediately at the feet of the Almighty. They have feathered bodies and limbs; they are crowned and have the hands raised. They both have a pair of wings above the head, and another pair partly conceals the legs; the feet are bare. The angel on the north side stands on a throne, an elaborate seat with jewelled front and a high back, much resembling the example 'Troni' in the glass of the ante-chapel, New College, Oxford. In the example in Queen Mary's Psalter the angel stands in front instead of upon the throne. The figure on the south side is standing on flames and at first might be thought to represent Seraphim, but Daniel vii, ver. 9, supplies the clue: 'his throne was like the fiery flame'. It should be noticed that there is nothing visible of the throne on which the Almighty is

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[1] *Two Treatises on the Hierarchies of Dionysius*, by John Colet, D.D., translated by J. H. Lupton, M.A. (1869), p. 20.

[2] *Batman uppon Bartholome, his booke De Proprietatibus Rerum* (London, 1582), fol. 7 b.

[3] Our Fellow Mr. G. McN. Rushforth, who has most kindly read the proof of this paper, writes: 'It is quite true that this is the regular conventional symbol for water, but angels are so essentially connected with the heavenly sphere that I cannot think terrestrial, mundane or earthly water is meant. I wonder if there is some reference to the "waters which were above the firmament" of Genesis i. 7, as distinguished from the "waters which were under the firmament", i. e. the seas; so that it would be an element of the celestial sphere like the clouds.'

supposed to be seated, but that the points of the upper wings of both the angels representing Thrones are stretched out towards and just touch the central figure (pl. LVII, fig. 1), perhaps an adaptation of the description in Exodus xxv of the Cherubim of the Ark: 'the cherubims shall stretch forth their wings on high, covering the mercy seat with their wings . . . And there I will meet with thee, and I will commune with thee from above the mercy seat from between the two cherubims which are upon the ark of the testimony.' Though this seems to be a possible meaning of this group of figures, it has to be admitted that I have not met with any medieval reference to the suggestion. The same arrangement, but with the Trinity in the middle, is seen at St. George's Chapel, Windsor, where the Nine Orders of angels are represented by pairs of three-quarter length figures set in a single hollow of the mouldings of the great east window.

The second hierarchy, according to the *Golden Legend*, is composed of the three orders that 'dominate and govern the university of people in common'. Its three orders are represented by eighteen figures of angels: Dominations, Virtues, and Powers.

There are so many references to Dominations or Dominions in both the New and Old Testaments that opportunity is given to a theological student to find representations in great variety. The first figure (no. 5, pl. LXI, fig. 2) in the outer hollow of the arch on the south side is one of the most striking of the series. It is mainly noticeable for the large twelve-pointed star which is held almost entirely covering the body; the arms and legs are feathered, and the bare feet stand on an open flower or star with a centre of flames. There are two pairs of wings, that which hangs downwards partly covers the thighs. The hair escapes from below a crown. This is different from the other representations, being formed of a narrow ornamental band resting on the forehead, and supporting a small leaf alternately with a large flower like a marigold, of which there are three. Unfortunately the top of this figure is somewhat decayed and only one of the flowers is complete. The star is plainly the 'Star of Bethlehem', the connexion with Dominations occurring in Balaam's vision and prophecy given in Numbers xxiv, verses 17 and 19: 'There shall come a Star out of Jacob, and a Sceptre shall rise out of Israel. . . . Out of Jacob shall come he that shall have dominion.' In the Nine Orders window in the church of St. Michael, Spurrier-gate, York, there are three angels marked Dominations, having between one pair of them a star; these windows have, of course, been much patched, and it may be only an accident that the star is there, but there is no reason to think that this glass does not all belong to the subject, and that the star has not the same meaning as at Warwick. This figure in the outer hollow, suggesting the beginning of Christ's work on earth, has near to it in the inner hollow an angel with the emblems of the finished work (no. 21, pl. LX, fig. 4). In the left hand is

a long cross-topped staff with a small banner on it similar to that with which Christ is commonly represented in the 'harrowing of hell' and the Resurrection: on the banner is a fiery star. In the other hand is a small closed book on the side of which is a cross within a ring, and a star-shaped aureole of four points. The angel is feathered, and has one pair of wings extended above the head, another pair almost covering the thighs, while on the left arm is a long hanging feathered sleeve looking like another small wing. Round the neck is a jewelled collar, and on the head a crown with flowers on the points. The legs of the angel are curiously crossed and might be intended to show that he was running, or possibly this is meant to represent the flying angel of the Apocalypse (Revelation xiv, verses 6 and 7): 'and I saw another angel fly in the midst of heaven, having the ever-lasting gospel to preach unto them that dwell on the earth, . . . Saying with a loud voice, Fear God, and give glory to him ; for the hour of his judgment is come': Judgement is always associated with Dominations. In 'Batman uppon Bartholome', in the chapter, 'How Angells be described', evidently meaning Dominations, as it comes directly before Powers, though the name is not actually given, we read : 'They beare in hande authorities and scepters, for after God they give all rightfull judgments.'[1] This angel stands on a wheel, the only one so represented. Wheels rightly belong to Cherubim, though it is not uncommon to see them with Seraphim, and even with ordinary angels. Accord-ing to Ezekiel the wheels followed the Cherubim or the 'four living creatures', and he says in ch. i, verse 21, after describing the latter, 'and when those were lifted up from the earth, the wheels were lifted up over against them : for the spirit of the living creature was in the wheels.' May not this figure on the wheel, by implying the four 'beasts', later used as the emblems of the evangelists, be meant for the 'gospel', in fact the finished work of Christ ?

There are five other figures holding books. This emblem generally is an attribute of the Cherubim, meaning divine knowledge, as at New College, Oxford, St. Michael's, Spurriergate, York, and St. Neot, Cornwall, but at Warwick this is not the case, for in each instance they are associated with Dominations meaning, presumably, divine law or justice. It should be noted that the books at Warwick are different from those held by Cherubim, for they are the books with the seven seals of the Apocalypse, and in one case the angels also hold sceptres.

In the inner hollow, on the north side, is an angel holding a book, its pages open and facing outwards (no. 22, pl. LXII, fig. 1). The angel's head is covered with a black skull-cap suggesting divine law. The favourite seventh chapter of Daniel gives a direct connexion : 'And the Ancient of days did sit, whose garment was white as snow, and the hair of his head like the pure wool ; his throne was like

[1] Batman, fol. 4 a.

the fiery flame, and his wheels as burning fire . . . thousand thousands ministered unto him, and ten thousand times ten thousand stood before him; the judgment was set, and the books were opened.' And after further references to the 'Ancient of days' and the 'most High' and 'judgment' at the end of the chapter (v. 27): 'And the kingdom and dominion and the greatness of the kingdom under the whole heaven, shall be given to the people of the saints of the most High, whose kingdom is an everlasting kingdom and all dominions shall serve and obey him.' These quotations are from the Authorized Version; its variations from the Vulgate are but slight.

The angel's dress appears to be an alb covered by a cope with an ornamental border, and secured by a large square jewelled morse. The wings are extended above the head. Black skull-caps, similar to this at Warwick, are worn by the Domination angels at St. Michael's, Spurriergate, York, and also by one of the group of six of the Nine Orders, apparently Dominations, in the Te Deum window in the south transept of York Minster. For much of the detail of the York glass I am indebted to our Fellow Mr. J. A. Knowles.

In the corresponding position on the south side is an angel playing the harp (no. 23, pl. LXII, fig. 2), the only example of a musical instrument in these sculptures, and therefore something more than just the angel musician. The paraphrase of the same chapter vii of Daniel given in Revelation v and xiv, the first of which is about the book with the seven seals, mentions 'the voice of many angels round about the throne . . . and the number of them was ten thousand times ten thousand, and thousands of thousands', all praising 'the Lamb', while in ch. xiv there is the description of 'the Lamb' and 'an hundred forty and four thousand'. 'And I heard a voice from heaven as the voice of many waters and as the voice of a great thunder; and I heard the voice of harpers harping with their harps.' This is only a tentative suggestion.

The two figures next to the top of the mullions each hold a book; again it is the book with the seven seals (pl. LVIII, fig. 2). One angel (nos. 37 and 38) holds it closed with both hands showing its clasps—the seals; the other (nos. 36 and 39) has the book held in one hand, and in the other is a sceptre which is laid across the open pages. The sceptre, which, with the star, occurs in Balaam's prophecy (Numbers xxiv. 12) appears as the usual attribute of Dominations in the glass at Great Malvern, on the screen at Barton Turf, Norfolk, and on the alabaster table in the Palace, Norwich. In the New College glass a sceptre is held in one hand and a sword in the other. Each of these angels holding books has the body, arms, and legs covered with feathers, the feet are bare, standing on 'water'. Those holding the closed books are bare-headed with hair curling on the shoulders; the waist, the neck, and the arms just above the elbows are encircled by a band of 'clouds'

studded with flowers for stars. There are two pairs of wings folded behind the back. The angel with the open book wears a jewelled crown and a long mantle hanging to the feet, and the girdle of clouds and flowers. These figures are in pairs, the reverse replicas appearing on each mullion.

Dean Colet in commenting on the Nine Orders says [1] Dominations are 'ruling over all and useful to all', while Powers 'have power and authority'. Powers are nearly always shown overcoming evil spirits: the four figures at Warwick all have this *motif*. Matching the Dominations angel with the star, there is on the north side an angel which might well be taken for St. Michael, it is so very like in form to figures we associate with the archangel (no. 4, pl. LXI, fig. 1). But in this position it must be intended for Powers. It might be described as a figure of St. Michael used as Powers. It is a feathered angel with bare feet and a pair of wings stretched upwards; he holds an upright sword in the right hand, and an orb with a cross on it in the left. On the head is a small crown resting on curly hair. Round the neck and waist are conventional clouds with ray-like pendants widely spaced, which, with plain pieces between, give the effect of tuilles. The feathers on the body and legs are much larger than on most of the other angels and somewhat resemble scale armour. There are two pairs of wings: one pair from the shoulders forms a rayed background for the head, the other hangs downward on either side of the legs. The feet are bare and rest on a demon, which has a body almost human in shape, but with claws for hands, and an animal's head with short snout and tusks, and pointed ears.

Close to this figure is a second Powers angel (no. 20, pl. LX, fig. 3). He is dressed in a shirt of chain mail reaching to the hips with a broad ornamental band at the neck. His legs are feathered, giving the impression of imbricated scale armour, terminated by leather knee caps with a row of feathers on the lower edge. This angel wears a large crown formed of a band of flowers, surmounted by tall brattishing, much of which, however, is now broken away in front. The wings are folded behind the back, but very little of them is visible. In the right hand is a large sword, and the left holds a sceptre. The bare feet stand on the shoulders of a hairy demon with an ugly head.

The third and fourth examples of Powers are in duplicate on the outside of the mullions at the third tier from the top (nos. 40 and 43, pl. LIX, fig. 1). Each is represented by an angel, with one pair of wings, in plate armour covered with a short mantle with ornamental border, fastened with a tasselled cord. The hands are bare, and one holds a sword which rests on the shoulder, and the other a long staff with an ornamental cross on the top. The legs are feathered to the ankles and the bare feet trample on a pair of winged devils. The hair is in curls standing out somewhat like rays round the head.

[1] *Op. cit.*, pp. 24, 25.

Fig. 4
Virtues, No. 9

Fig. 3
Virtues, No. 8

Fig. 2
Dominations, No. 5

Fig. 1
Powers, No. 4

Fig. 4
Archangel Gabriel, No. 27

Fig. 3
Archangel Michael, No. 26

Fig. 2
Dominations (?), No. 23

Fig. 1
Dominations, No. 22

Fig. 1
Beauchamp, No. 10

Fig. 2
Beauchamp impaling
Berkeley, No. 11

Fig. 3
Latimer, No. 24
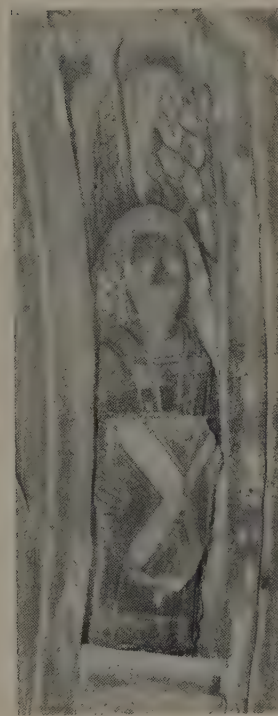
Fig. 4
Neville, No. 25

Fig. 5. Mauduit of Hanslope, No. 12

Fig. 6. Toney, No. 13

Fig. 4
St. Mary Magdalen, No. 15

Fig. 3
St. Barbara, No. 14

Fig. 2
Angel of the Nativity, No. 29

Fig. 1
Angel of the Expulsion, No. 28
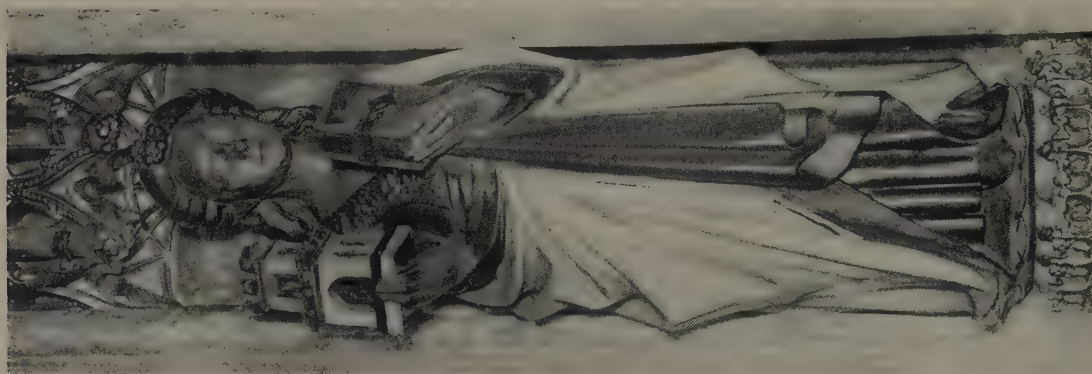
By the side of this angel is one of Principalities, moved up from its proper position in the third hierarchy to one in front of Virtues as represented on the mullions. The reason is fairly obvious, Principalities and Powers go together almost naturally.

Of the order Virtues there are two figures opposite one another in the outer hollow of the arch mould, and, apparently, both the figures at the bottom of each of the mullions. The angel in the arch on the north side (no. 8, pl. LXI, fig. 3) wears a dalmatic, having long sleeves and a band of ornament at the neck and round the waist; on the wavy hair is a small crown. The wings are extended high above the head. The feet are bare and stand on 'water'. A censer is held in the right hand, and in the left is an incense boat. Remembering that Virtues, according to Batman uppon Bartholome, 'be a company of Angells, and their service is to virtues, and to do miracles',[1] it would seem that this angel represents the angel of the Apocalypse which 'came and stood at the altar, having a golden censer; and there was given unto him much incense, . . . And the angel took the censer and filled it with fire from the altar and cast it unto the earth; and there were voices and thunderings and lightnings, and an earthquake', with seven-fold developments following. The Virtues angel on the Southwold screen carries a censer, but in the other hand a crown.

The angel opposite on the south side (no. 9, pl. LXI, fig. 4) has a plain dress with a broad tippet on the shoulders; both dress and tippet have an ornamental band on the edge; the sleeves terminate at the elbows, and have wide hanging openings. The hair escapes from below a close fitting coif. The feet are bare and rest on 'water'; the wings are folded behind the back. The right hand is raised to the breast, and a large long-necked bottle is held to the shoulder with the left. Again referring to Batman uppon Bartholome, in the chapter 'How Angells be described', we read, 'They are sayde to have Phyals with sweet smelling things, for by dooing of them our wounds are brought to grace of health';[2] a description which seems to be quite definitely intended for the Virtues angel. To a theological student, however, the vial might also be an emblem of the miracles of the seven angels of the wrath of God in the Apocalypse. In illuminated MSS. the angels of the sixteenth chapter hold vials in just the same way as do the Virtues angels. Thus at Warwick the angel with the vial would be a companion to that opposite—the angel with the censer and fire, heralding the other seven miracles of the eighth chapter.

The *Golden Legend*[3] says of Virtues: 'To them is given power to do all things difficult . . . and therefore it is attributed to them to do miracles.'

Of the Virtues, at the bottom of the mullions facing inwards, both are represented by a feathered figure with two pairs of wings and bare feet standing

[1] Batman, fol. 9 *b*.   [2] Batman, fol. 5 *a*.   [3] Vol. v, p. 186.

on 'water' (nos. 45 and 46, pl. LIX, fig. 2). The hair is rather long and curly, partly hiding an ornamental band or diadem on which, over the forehead, is a large cross. From the shoulders hangs a cope with an orphrey enriched with flowers. One hand holds a chrismatory, the other raises the roof-like cover. A very similar angel to this, holding a chrismatory and named 'Virtues', is to be seen in the glass of the Priory Church of Great Malvern.

The other figures (nos. 44 and 47, pl. LIX, fig. 2) on the outside of the bottom tier are feathered, and have three pairs of wings; each has a band at the neck, others round the upper arms, and a girdle, all of 'clouds' with flower-stars. The feet are bare and stand on 'water', and the hands are folded on the breast. There being no actual emblem it is hard to allocate this pair of figures, but it is suggested that the attitude, with the hands placed exactly as those of the Blessed Virgin in representations of the Annunciation, is meant to convey the idea of the 'miracle' of the Immaculate Conception.

The figures in the hollows of the arch described so far are those of the first two hierarchies: these are in the upper part of the four-centred arch. Just at the springing in the quick turn of the arch, the hollows are filled with angels holding shields. These divide the second from the last hierarchy, which like the first, as represented at Warwick, contains two figures of each of the three orders, Principalities, Archangels, and Angels.

On each mullion is a representation of Principalities (nos. 41 and 42, pl. LIX, fig. 1), the angels already alluded to as standing by the side of Powers. They have feathered legs and bare feet standing on 'water'. On the head is a crown, and round the hips is a girdle of clouds and flower-stars, with a fringe of down-ward pointing rays on the lower edge. There is a pair of wings folded behind the back. Round the neck is a scarf, and from the shoulders hangs a long mantle. One hand holds a sceptre, and in the other is a sword.

Immediately below the angels with shields, in the inner hollows of the jambs, there are, opposite one another, the Archangels Michael and Gabriel. The former (no. 26, pl. LXII, fig. 3) is a feathered figure with bare feet standing on 'water', and with two pairs of wings, one pair extended and crossed behind the head, the other held downwards towards the feet: the curly hair is arranged in a series of whorls round the face, and on it rests a narrow diadem supporting a large ornamental cross. The lower part of the mantle is held up on the right side by being thrown over the forearm. The right hand holds a long spear point downwards; the shaft is ornamented by a spiral band running its whole length. On the left forearm, at the waist level and supported by a strap from the right shoulder, is a small shield, on which is a fleur-de-lys within an orna-mental border.

The Archangel Gabriel (no. 27, pl. LXII, fig. 4) is plainly the figure taken

from representations of the Annunciation, with the right hand raised in blessing, the left holding a large lily with its flowers resting on the shoulder. He wears an alb and a very ornate dalmatic, which has a broad band of rosettes at the neck and a series of floriated diagonal bands at intervals from the neck to the bottom. The wings are extended above the head, and some of the primary feathers cross one another. On the head is a crown with a large cross over the forehead.

Below the Archangels are the Angels. The one on the south side (no. 29, pl. LXIV, fig. 2) holds a staff in the left hand, the right is raised, the forefinger being hooked over the top of the dress: the feet are bare, standing on a plain surface. The dress is a simple girded alb, with an elaborate enriched band, at the neck and at the bottom, consisting of a flowing pattern with foliage and roses. The same roses appear on the background behind the legs. On the short curly hair is a chaplet of flowers; the wings are folded behind the back. There is some similarity in this figure to the Angel on an alabaster table of the Nine Orders of angels in the Palace at Norwich. Both have the chaplet, but the Norwich angel carries roses in the hand.

The Angel on the north side (no. 28, pl. LXIV, fig. 1) is very different from its fellow: he is entirely feathered, with a 'cloud' and 'flower-star' girdle, and a plain band of ornament with flowers at the neck. The diadem is a flat band on the forehead having a large cross in front. The wings are folded behind the back, and the bare feet stand on 'water'. The most noticeable thing about the figure is the very large sword, once longer by several inches, for the top is now broken away; it was at least as long as the top of the wing, for the mark where it was attached is to be seen. It is held in the right hand; in the left is an apple, and the background behind the legs and feet is covered with sprays of apple foliage and fruit. The big sword suggests that this must be the Angel of the Expulsion. It is so, for example, with that particular angel in the Angel choir at Lincoln, and this image with the apple, in this the chapel of our Lady, suggests that Eve, the first mother, was driven from the garden of Eden and Paradise; and the other angel, that with the staff, and standing on the earth, not 'water', may possibly be meant for the messenger angel at the Nativity, suggesting that it was through the Blessed Virgin that humanity has been brought back again.

This completes the Angels of the Nine Orders. The half-length angels holding shields at the springing of the arch have yet to be described. They are all crowned and are dressed in albs, each varied a little, the pairs harmonizing. Those in the inner hollow, and the lower ones in the outer hollow, rest on the top of the canopies over the figures below, the drapery of the upper pair ends with a *nebuly* effect. The shields which they hold are painted with the

arms of the Beauchamp family and its connexions. It is possible that they are copies in part of the original, but of that we have no proof. They were painted probably with the rest of the work, including the figures; this is dated by an inscription written in gold on the sword of the Angel of the Expulsion 'Regilt Octr. 1824'. The charges on the upper pair in the outer hollow are: on the north side *Beauchamp* (no. 10, pl. LXIII, fig. 1); on the south, *Beauchamp* quartering *Newburgh*, impaling *Berkeley* (no. 11, pl. LXIII, fig. 2), for Richard Beauchamp and his first wife. Below these, the angel on the north side holds a shield with the arms of *Mauduit of Hanslope* (no. 12, pl. LXIII, fig. 5), Richard Beauchamp's ancestor. Isabella, sister and heiress of William Mauduit, the last Earl of Warwick of that family, brought the earldom and estates to the Beauchamps by marriage with William in the reign of Henry III. Opposite is *Toney* (no. 13, pl. LXIII, fig. 6) for the family of his great-grandmother. In the *Pageant of the Birth, Life, and Death of Richard Beauchamp* it is shown that he chose to wear at the three days' tournament in France, first the arms of *Toney*, second the arms of *Mauduit of Hanslope*, and thirdly *Newburgh* and *Beauchamp* quarterly, with the arms of *Toney* and *Mauduit*.

In the inner hollow on the south are the arms of Richard Neville, 'Warwick the Kingmaker' (no. 25, pl. LXIII, fig. 4), Richard Beauchamp's son-in-law; and on the north those of *Latimer* (no. 24, pl. LXIII, fig. 3) for another son-in-law, of whose family two or three were buried in the Chapel after the battle of Edgcote, 1469. The last payment in connexion with the building of the chapel was made in 1463. This rather suggests that the painting of the shields may not exactly copy the original.

The coats of arms within garters, near the top of the window (pl. LVII, fig. 1), are the cross of St. George (no. 2) on the north and the royal arms (no. 3) on the south: below on the north *Beauchamp* quartering *Newburgh*, on a shield of pretence *Despenser*; on the south *Newburgh*.

At the west end of the chapel, over the entrance doorway, there is another angel with a shield on which are carved the arms of the earl, *Beauchamp* quartering *Newburgh*, with a shield of pretence bearing the arms of the family of his second wife, Isabel Despenser.[1]

In the outer hollows of the jambs are placed the female saints, two on each side. The upper one on the north is St. Barbara (no. 14, pl. LXIV, fig. 3). She wears a tight fitting cap with a large roll or wreath, instead of a brim, on which is a flower ornament in front, and some of the hair is dressed over it: the rest of her hair is long and flows behind her shoulders. Her kirtle is tight fitting above the waist, and hangs in straight folds to her feet. The mantle is held

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[1] Since this was read this angel has been cleaned; it is evident that it has been much recut and repaired, and it may not be original.

Fig. 2. Censing angel and St. Margaret
Nos. 31 and 17

Fig. 1. St. Catherine and censing angel
Nos. 16 and 30

Fig. 1. Queen of Heaven in eastern panel

Fig. 2. Coat of Arms in centre panel

Fig. 3. Coat of Arms in western panel

Panels in the vaulting

up in front by her left hand; she holds a book which is closed and fastened by one clasp. In her right hand is a tower, battlemented at its two storeys; the lower one has a wide pointed arch in front and two windows at the side, the upper storey having a square-headed window on each face.

Beneath St. Barbara is St. Catherine (no. 16, pl. LXV, fig. 1): her dress is cut low at the neck and falls to the feet with no girdle or waist-band; her mantle is held up by her right hand. She wears a crown, and her hair is long and flowing. On the palm of her left hand is an open book, her right supports a large sword which rests with the point near her feet, the pommel level with her chin, and almost concealed by the mantle.

On the other side is St. Mary Magdalen (no. 15, pl. LXIV, fig. 4), wearing a mantle over a simple high-waisted dress; the right hand is raised, the forearm holds up the side of the mantle by pressing it to the body, the left hand holds up the other side of the mantle, and also a circular 'alabaster box of ointment'. On the head is a veil which hangs in folds on the shoulders; from under this appears long curly hair.

Below is St. Margaret (no. 17, pl. LXV, fig. 2), with her hands in the attitude of prayer, standing on a dragon. She is crowned, and her hair is long and flowing. She wears a tight-fitting cote with an ornamental band at the neck and wrists; this reaches to the hips and a long and full kirtle shows beneath it. One side of her mantle hangs straight, the other is held pressed to the waist. The dragon lies on its back with its head and tail turned upwards.

On either side in the inner hollow is a censing angel (nos. 30 and 31, pl. LXV, figs. 1 and 2), placed a little lower than the other figures. Each has short curly hair and an ornamental band on the forehead. They both are dressed in the same way, a long girded alb and a crossed stole and a scarf round the neck. The feet are bare, being only just visible under the alb; they stand on 'water'. The wings are folded behind the back. It is noticeable that not one of the figures, either saint or angel, has a nimbus.

All the figures that stand vertically—those on the jambs and mullions—are carved independently and placed in their niches; those above form part of the arch stones themselves, and were carved in position. In the case of the former there is a groove cut down the back made to fit over a bead which runs down the centre of the hollow. Each figure is fastened by being hooked up; there is an iron strap across the groove in the back of the figure which hangs over a hook fixed in the centre of the stonework (no. 31, pl. LVII, fig. 2). The bead acts as a guide when hanging up the figure and also keeps it straight.

Below the window at the present time there is an elaborate plaster canopied reredos, erected in 1735 to replace that destroyed by the Puritans, the detail of its pinnacles being an attempt to copy the original work in the chapel. The

centre panel contains the Annunciation in low relief, and on either side are two large empty niches. It is known from the contracts that in medieval times there was an important representation of the same subject here for, as stated in the agreement, 'Kristian Coleburne, Peinter dwelling in London, doeth covenant to paint in most finest, fairest and curious wise, four Images of stone ordained for the new Chapell in Warwick; whereof two principall Images, the one of our Lady, the other of St. Gabraell the Angell; and two lesse images, one of St. Anne, and another of St. George.' Fragments of the old reredos may have been in existence, and this plaster structure may be an attempt to replace the original, the niches on each side being for the two lesser figures. There are, however, now two empty niches, four feet high, on either side of the east window which once contained figures; it may have been here that the two saints were placed.

Over all the figures that stand vertically are well designed canopies of tabernacle work and delicate tracery, those at the top of the mullions having elaborate spire-like terminations over them: the figures on the arch rest on corbels of varying designs, but with no canopies.

The roof of the chapel is vaulted in three bays, in the centre of each is an irregular octagonal panel with curved sides. In that over the main tomb (pl. LXVI, fig. 2) is a small shield with the arms in paint of *Beauchamp* quartering *Newburgh*, and on a shield of pretence *Clare* quartering *Despenser*. The shield is set diagonally; over it is a helmet and crest of a swan's head gorged with an earl's coronet; from this extends a tasselled mantling feathered in the same way as the swan's neck. The panel in the western bay (pl. LXVI, fig. 3) contains a three-quarter-length angel holding a shield painted with the arms of *Newburgh*. The shield is practically square with three points in its top and bottom. On the dexter side is the hollow for fitting against the tilting spear. The folds of the drapery of the alb terminate at the bottom in *nebuly* shapes. The wings fall on either side of the figure.

The panel in the eastern bay contains a representation of the Blessed Virgin as the Queen of Heaven (pl. LXVI, fig. 1). She wears a simple dress and mantle and holds a sceptre in her left hand and an orb in the right, and her crown is a narrow band of pearls with a group of three pearls on each point. She stands on the crescent moon within a vesica of cloud, outside which is an aureole filling up the entire panel. Last year, on the removal of the dark paint with which the chapel had been for so long disfigured, it was found that the whole of the ribs and the filling pieces of the vaulting had been originally white. None of the mouldings had been picked out in colour as might have been expected, but the spaces between the ribs surrounding the representation of the Blessed Virgin had been coloured dark blue, forming a background more or less in the form of a cross and giving a very unusual and surprisingly beautiful effect (pl. LXVII, fig. 1).
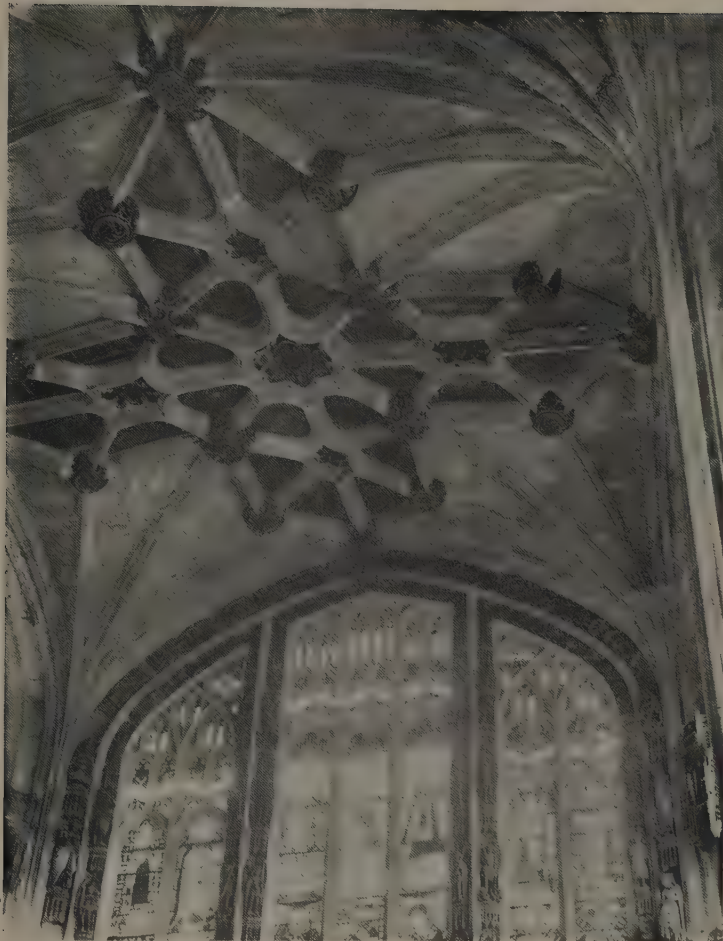
Fig. 1. The eastern bay of the vaulting
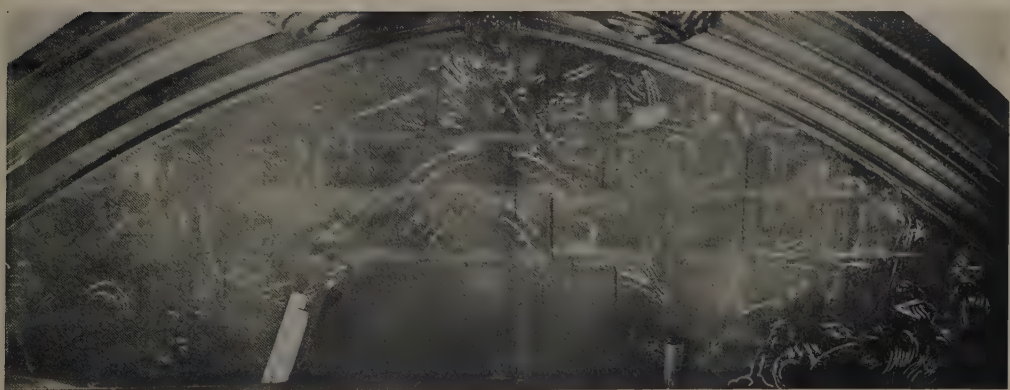
Fig. 2. Traces of the fifteenth-century picture of the Last Judgement

Fig. 1. Vaulting boss
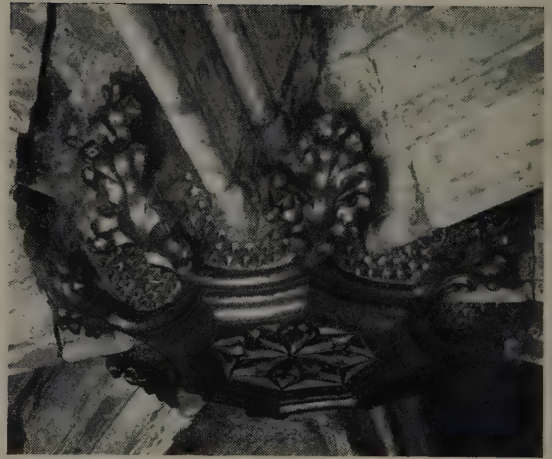
Fig. 2. Vaulting boss
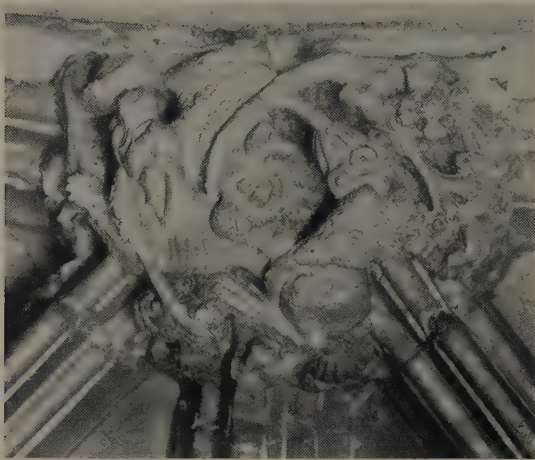
Fig. 3. Vaulting boss

Fig. 4. Carving in string

The vaulting bosses were, of course, enriched; they were re-painted, apparently, like the rest of the carved work, about a hundred years ago. The majority are of the usual conventional designs, all well executed, but some are exceptional (pls. LXVIII and LXIX). One meets with natural forms of flowers and foliage in illuminated MSS. of the latter part of the fifteenth century; it is therefore not surprising to find the same thing in vaulting bosses. One of these is of strawberry leaves and fruit and flowers, another blackberry; the most striking is the dog-rose. Perhaps the most unusual is one in which the common cowparsnip is introduced; one would not expect to find that in a vaulting boss. This comes over the point of the southern central window where the wall meets the vaulting ribs. The similar boss over the western window of the south side (pl. LXVIII, fig. 3) has some of the same flowers and foliage, but in conjunction with an animal subject, the only instance in which the bosses are not simply flowers, fruit, or foliage. It is not very distinct as it has been somewhat affected by damp from a leaky gutter. The subject is a lion seizing another animal in the back. The same *motif* appears in the carved string to the left of the entrance porch (pl. LXVIII, fig. 4), and these two are the only representations of animals in the chapel, except those which are purely heraldic, the Beauchamp bear, the Despenser griffin, and the royal lion. The species of the animal attacked by the lion is not clear; it has sharp claws and a tail with a tuft on the end. Our Fellow Mr. G. C. Druce suggests a dog. As the representation of this subject occurs twice and as no other animals appear in the carving, it has been suggested that some hidden meaning is intended.

The decoration of the chapel was undoubtedly a united scheme: The Annunciation in the centre as a reredos with the Queen of Heaven above in the vaulting; at the east end the Almighty with the heavenly host in the carved stonework, and the latter also in the glass of the tracery lights of the window, where feathered angels are holding a scroll with music and songs of praise to the Virgin: other angels in the side windows, both in albs and with feathered bodies, with more music, and others again with musical instruments. The lower part of the stone carving has saints, and there were other saints in the glass together with apostles, prophets, and martyrs; and in various places stand censing angels. The scheme of decoration was completed by the great painting of the Last Judgement at the west end. This we know from the contracts to have been originally painted in 1449 by 'John Brentwood, Citizen and Steyner of London'; for this he was paid 12*l*. In 1678 Sir William Dugdale arranged for the re-painting of the picture as it was decayed. In so doing he did not attempt to touch up the old one or to repaint it on the old lines, but took as his model Michelangelo's picture in the Sistine Chapel of the Vatican. He paid to 'Mr. Richard Bird for his work in painting

the Resurrection in oyle at the west end of the Chapel (ye like before being decayed) 6*l.*'

To-day Sir William deserves a great debt of gratitude. He persuaded Lady Katherine Leveson to leave in her will a charge on certain property of 40*l.* per annum towards the preservation of the chapel and its contents, the two trustees being Sir William Dugdale and his heirs and the Mayor of Warwick for the time being. It will be understood that in the past, when things ancient were not so much valued as they are now, but for this financial help, the chapel, being of little use to the parish church, might easily have been allowed to fall into disrepair.

Till last year this picture was covered with the same dismal paint that disfigured the rest of the building. Sixteen years after the picture had been painted, that is in 1694, came the great fire of Warwick destroying a large part of the town and the western portion of the church. The only damage done to the chapel was the destruction of the gallery and screen that went across the west end, and the blistering of the picture from the heat of the flames. The position of the screen can be seen on the west wall in the blank space below the picture.

Following the fire the whole of the church and chapel seems to have had a liberal coat of whitewash covering everything, but this picture at the west end was coated with a thick hard white oil paint. Before any of the dark stone-coloured paint was removed, it was noticed that there were several raised lines visible on its surface, and in a strong sidelight many more were discovered. These were marked out in chalk, and it was soon apparent that they were some of the outlines of the medieval painting which were sufficiently raised to show through three coats of oil paint (pl. LXVII, fig. 2). Now that the surface is not a plain one they are not so easily seen, though in one case the outline of the greater part of an angel in armour can be made out, showing that the drawing was of a very high order of merit. The outlines revealed by the chalk-marks show that the picture represented Christ seated on a rainbow with His feet on another. On His right and left would be the angels with emblems of the Passion; the straight line is probably the scourging pillar, and on either side are the seated apostles. The lower parts of the picture were not clear except for the one angel already mentioned, which is on the north side.

Of the other work in the chapel one is struck by the unusual plainness of the stalls: these generally have a lavish amount of ornamentation. That it was not for lack of funds is obvious, for the workmanship is, like everything else, of the best. They were made by 'Richard Byrde and John Haynes, Citizens and Carpinters of London', and they were to receive 40*l.* for the work; all materials being found for them. The carving is confined to the poppy heads

and elbows, the fronts being divided into square moulded panels, each containing a shield and quatrefoil. The poppy heads in themselves are not large : they are well carved, and in the foliage several distinctive touches are worked unobtrusively. The earl's badge, the bear and ragged staff, occurs frequently ; in one there is an angel holding a shield carved with the arms of the Newburgh family. The panelling at the back is widely spaced, the moulded uprights terminating in four centred and cusped arched heads. Over this is a carved string and foliated brattishing. As far as can be seen now the string, the brattishing, the small spandrils and flowers on the points of the cusps were all that were coloured or gilded. There was also colour and gilding on the moulded and carved stonework below the window sills, and the backs of the niches at the same level were painted red. Above, all was white except the picture at the west end and the statuary at the east, the vaulting bosses, and the big blue cross behind the Queen of Heaven (pl. LXVII, fig. 1). This unusual restraint in ornamentation and decoration was for a specific purpose ; and this can only have been to emphasize the work at the east end. The climax of the whole scheme must have been in the reredos, and the lack of that at the present day makes it difficult to put all the other work in its proper place. That the reredos had this effect is perhaps shown in the fact that Col. Purefoy, in that fit of Puritanical zeal which led him first to destroy the market cross, on entering the church, with the details of which he, no doubt, as a Warwickshire squire, was perfectly familiar, 'fought resolutely against . . . the antient monuments in the Earles Chappell in St. Maries Church ', as a Royalist account gives it ; that is, he made straight for the reredos, and ignoring all the other 'superstitious images ', as he would consider them, which were displayed above, he concentrated his efforts on the culminating feature in the chapel. That he spared us the less important statues we are now profoundly thankful.

<div align="center">DISCUSSION</div>

Mr. FFOULKES exhibited lantern-slides of Italian armour dating from about 1490 in illustration of the suit on the Warwick tomb in the Beauchamp chapel.

Rev. E. E. DORLING was as grateful for the careful description given as for the enlightened method of delivery ; but disagreed with the author on one point. Several of the figures had been said to stand on water, but the substance below the feet must be clouds, as was shown by many MSS. The figure of an angel with a long spear standing upon a monster reminded him of St. Michael at Ranworth, in spite of the author's disclaimer ; but alternatively it might be the third archangel, as only two had been identified.

Mr. ARTHUR GARDNER suggested that the excessive wages paid to Bartholomew Lambespring included the cost of the gold leaf used. The Angel of the Expulsion was found also at Lincoln, and the author might have been more successful than himself in elaborating a scheme for the sculpture in that cathedral. It was interesting to have such work brought before the Society while Flemish art was on exhibition in Burlington House. Foreign influence was seen more in the bronze weepers of the tomb than in the angel sculptures. There were reminiscences of Burgundian work, as at Dijon.

Mr. CHATWIN replied that he had been at first ready to identify the figures near St. Margaret and St. Catherine as archangels, but both figures were required as angels. The gold leaf was found for the highly paid workman mentioned. He had derived some help from the Angel choir at Lincoln, but could not by any means make out a perfect sequence. The figures at Warwick were intended to be seen from below, and the position of the scaffolding made it necessary in some cases to photograph them from above. Several were found in a delicate state, and the failure of the south-east buttress had endangered the east wall of the chapel, and some damage had been done to the figures thereby.

The CHAIRMAN (Mr. Emery Walker) remarked on the excellence of the photographs and detected a few cases of slight restoration. The paper was one of great interest, and well deserved the thanks of the Society.

Fig. 1
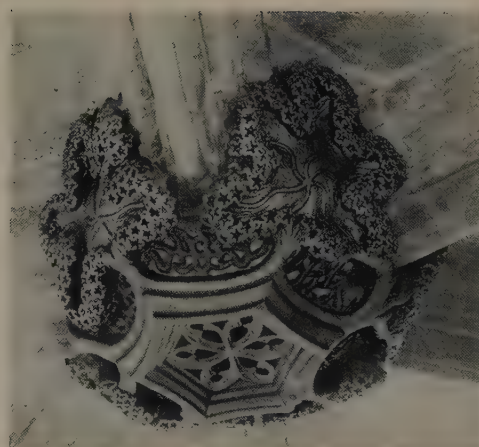
Fig. 2

Fig. 3
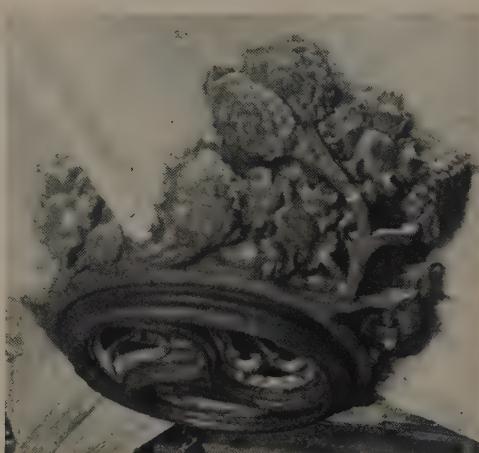
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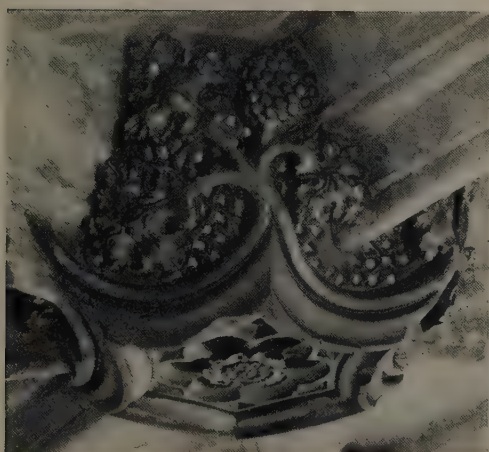
Fig. 5
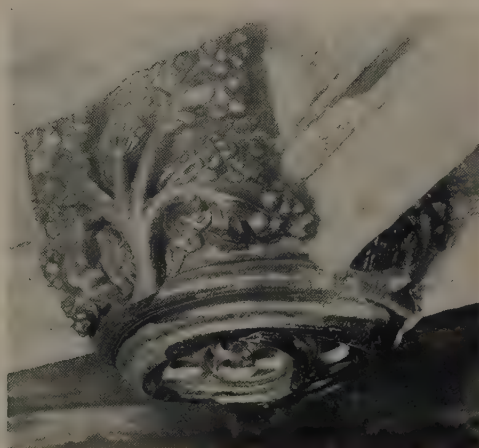
Fig. 6

Vaulting bosses

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